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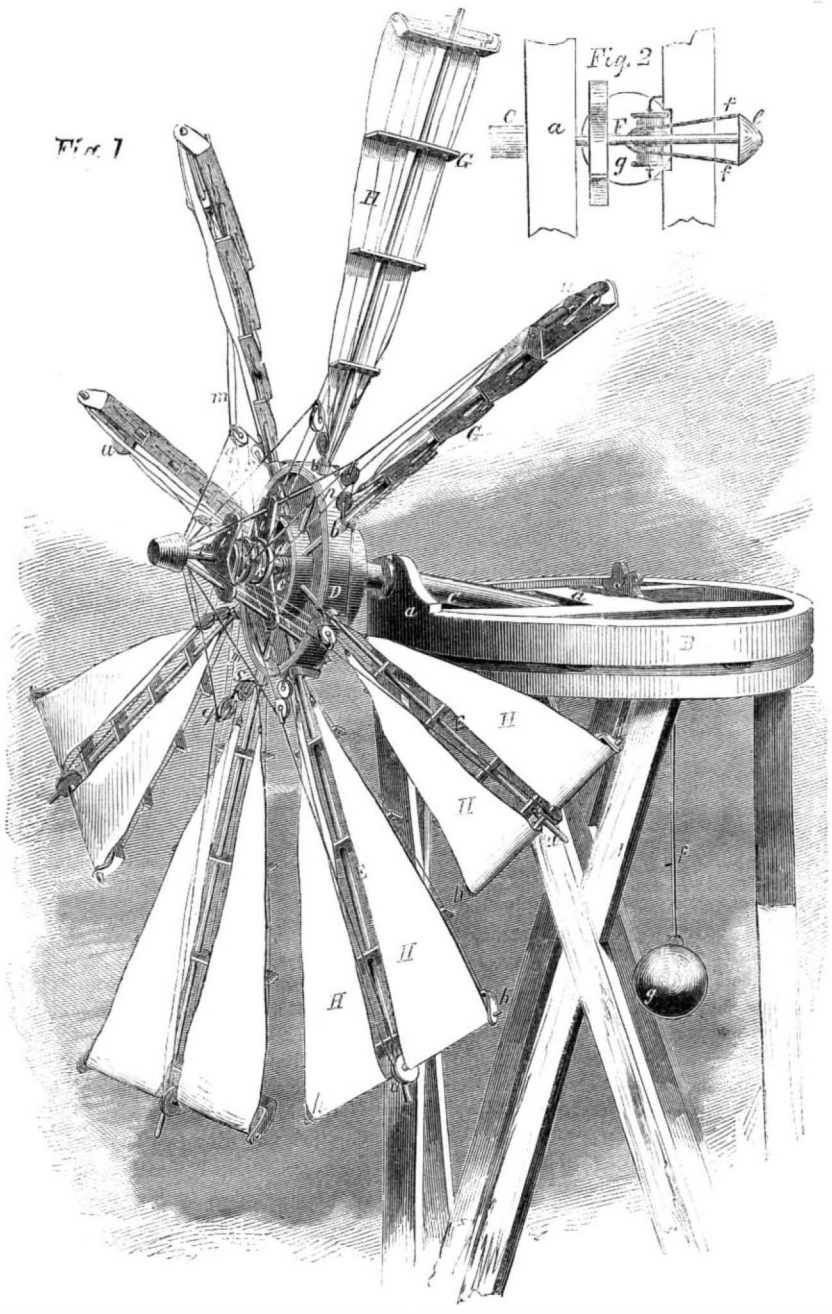
Candy and Poison.

A paper on "Colored Confectionary" was recently read before the British Association, from which we condense some valuable and novel information. We learn that, for economy's sake, confectioners, in coloring candies, &c., have recourse for their greens to Brunswick green, carbonate of copper, or arsenite of copper; for the yellows, to chromate of lead or gamboge; for their reds, to red lead, vermilion, or cinnabar; and for their whites, to white lead. These are only a few of the pernicious coloring agents used, and they are among the deadliest poisons. The way in which these poisons are laid on also deserves a word of passing remark. In some instance a very thin coating of the coloring matter is used, so as to spread over a very large surface a small portion of the material used; but in other cases the very reverse is the fact, and in one instance a quantity of arsenite of copper sufficient to destroy the life of a healthy adult was procured from a piece of ornamental table confectionery, not the size of a sugar almond. Confectioners have no reason to use these poisons, for there are harmless vegetable colors enough to answer their purposes. Among these are—for yellows, saffron, tumeric, French berries, Persian berries, quercitron bark, fustic-wood, and lakes of the last four colors. Reds—cochineal, lake ditto, including carmine, Brazil wood, madder, and lakes of the last two colors. Purples—madder purple, logwood and indigo, any of the lakes with indigo or litmus. Blues—litmus and indigo. Greens—sap green (*rhamnus catharticus*), mixtures of any of the vegetable yellows or lakes with indigo, including Persian berries and indigo. Nor would the products of their arts suffer in their attractive appearance by the employment of such colors. We most strongly advise every one who values his health, and perhaps his life, as matters are at present constituted, sedulously to avoid partaking of articles of confectionery exhibiting either blue or green, but especially of such as are green, these latter being but too frequently of a most deadly poisonous nature.—*Am. Druggist's Circular.*

A Consumption Detector.

Dr. Scott Alison has introduced a new instrument for the detection of diseases in the chest, which he calls the "chest goniometer," or angle measurer, by which he is enabled to detect the slighest deviation from symmetry, and thus to discover depression in a very early stage of consumption, and to mark the progress of the disease, whether favorable or unfavorable. The instrument is of ivory, and very light and portable.—*London Lancet.*

WITTING'S WINDMILL.



The windmill represented in our illustration is one of those having sails of cloth, and the object of the invention is to make them self-adjusting, and render them capable of being easily furled. The sails present a large surface to the wind, and the action of that force sets them at the obliquity necessary to maintain an equal and regular speed.

A represents a framing, on the upper end of which a rotating cap, B, is placed, which can freely turn on the frame by means of friction rollers and a base fitting into the circle on the top of A. C is a hollow shaft resting in suitable bearings, *a a*, on the cap, B. The outer end of the shaft, C, has a hub, D, attached to it, and spindles, E, are fitted radially in it, the lower ends of the spindles passing through annular ledges, *b*, on the face of the hub, and every alternate spindle has a part pinion or segment, *c*, on its lower end. These toothed segments, *c*, gear into a cylindrical rack, *d*, on the outer end of the rod, F, which is fitted loosely within the shaft, C, the inner end of the rod bearing against a plate or step, *e*, Fig. 2, (which is a plan view of it,) having a cord or chain, *f*, and a weight, *g*, attached to it.

The spindles, E, have each a light frame, G, on them; these frames gradually increase in width from their inner to their outer ends, and are connected with the spindle rather out of center, so that the wind will act more powerfully at one side than the other, and have a tendency to turn the spindles, so that the frames will be presented obliquely to the wind. The frames of the spindles have links at their lower ends, which are connected to the alternate spindles that do not gear with the rod F, at *d*.

H represents the sails, the upper ends or broadest parts of which are fastened to rollers, *h*, at the extremity of the frames. From the above enumeration of the parts, it will be seen that the weight, *g*, is employed to counteract the force of the wind against the sails, and keeps them presented to the wind at a proper angle, which will vary according to the wind's velocity, a high wind overcoming the gravity of the weight and turning the sails in a very oblique direction, so that the whole effective force cannot be exerted on the sails. During a light wind, the weight will keep the sails less inclined, and give more surface to the atmospheric currents, thus maintaining an equal speed during the varying velocities of the wind. On the outer end of the rod, F, a cylinder, I, is permanently attached, and it is placed between two plates, *i i*, and carries two drums, *j k*. The inner peripheries have ratchet teeth in them, the teeth of one drum being in a reverse direction to those on the other; and pawls on the cylinder, I, catch into the teeth on the inner sides of *i i*. To the outer drum, *j*, cords, *p*, are attached, which pass through pulleys, *q*, connected with the cords *m*, secured to the frames, G, one to each, and the ends of the cords pass through blocks, S, attached to the lower end of the spindles, and then the cord is tied to the sails. From the inner drum, *k*, cords, *t*, pass around pulleys, *u*, on the rollers, *h*, to which the broad end of the sails are fastened. On the inner end of the rod, F, a hand wheel, J, is placed; by turning this wheel in one direction, the outer drum, *j*, will be turned in the same direction, while the inner drum, *k*, will rotate in the contrary, and by reversing this operation the sails can be furled or unfurled. Instead of the cords, *m*, the frames, G, may have small laths or ribs; and the sails, H, ought to be provided with small cross laths with grooves in them, to correspond with the ribs on the frames, and sewed on the backside, so that they would slide on the ribs by furling or unfurling the sails, and prevent them from slipping to the side.

This windmill is the invention of F. W. Witting, of Twelve Mile Coletto Gin, Texas, and was patented by him March 24, 1857. Any further particulars may be had by addressing the inventor, care of E. Eckhardt, Yorktown, Dewitt co., Texas.

Consumption of Gas.

The following statistics will enable our readers to form some conception of the enormous consumption of gas, and of the extent to which this branch of industry has attained. Muspratt, in speaking of the influence of chemistry, says that in England, 6,000,000 tuns of coal are annually employed for the manufacture of gas, and from 12,000,000 to 15,000,000 pounds sterling are expended in its production. In London alone 500,000 tuns of coal are annually used, producing 4,500,000,000 cubic feet of gas, and 500,000 chaldrons of coke; of the latter, 125,000 chaldrons are consumed in manufacturing the gas, and the remainder is sold for fuel. Upwards of half a million houses in London burn gas, and the length of the main arteries for conveying it is 1,600 miles. The capital employed in the metropolis for the production of gas is $20,000,000. The manufacture of coal gas for the purpose of illumination affords one of the most striking instances of the triumphs of science when enlisted in the divine cause of civilization. Looking at it as a whole, and regarding the ingenuity evinced in the construction of apparatus, the chemical skill and beauty displayed in the process, and the very valuable purposes to which it is applied—it forms one of the most beautiful, curious, and useful of our manufactures; and probably there is no subject of a manufacturing character in the present day which more engages public attention—coal gas having now become not a mere luxury, or even convenience, but an absolute necessary.

The Leviathan.

L'Invention, speaking of this ship, concludes its article with the following eloquent remark:—"We wish good fortune to this noble vessel. Such a ship floating upon the ocean, whose bed is crossed by a transatlantic cable, is a proper spectacle to give a high idea of human power and the progress of civilization."

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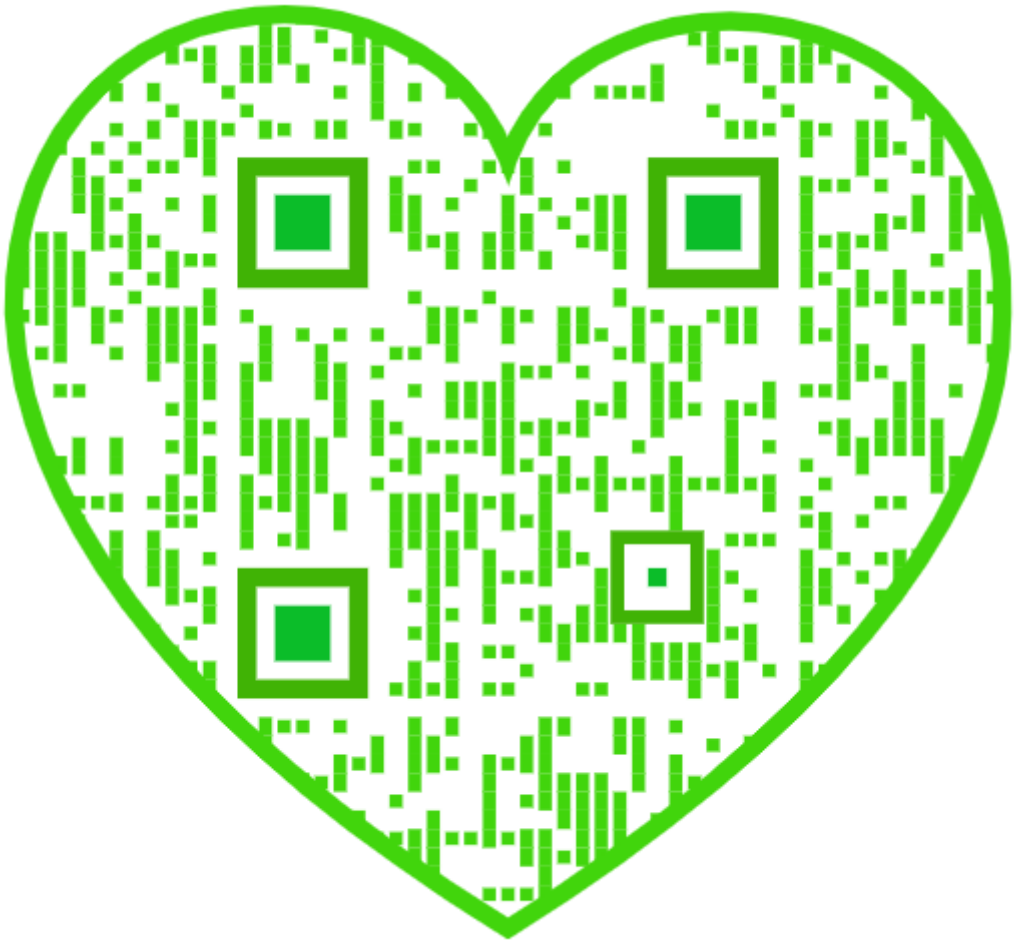

Issued from the United States Patent Office

FOR THE WEEK ENDING DECEMBER 29, 1857.

[*Reported officially for the Scientific American.*]

STRAW CUTTERS—Wm. Barrett, of Stephentown, N. Y. : I claim the combination of gage, K, and its handle, H, with the bar, G, and link, L, and spring, S, by means of which an oblique drawing as well as downward movement is given to the knife, substantially as set forth.

HAND STAMPS—E. F. Barrett, of Salem, Mass. : I claim so arranging and constructing the ink fountain, O, that when combined with the inking roller of a hand- stamp press, it shall serve the double purpose of inking the roller and distributing the ink over its surface in the manner substantially as described.

GEARING FOR FEED ROLLERS IN RE-SAWING MACHINES—D. B. Bartholomew, of Lancaster, Pa. : I claim the arrangement of a screw shaft, K, transversely and at right angles to the vertical adjustable feed rollers, G G', when combined with the gearing, J J J, by means of a screw pinion, L, substantially as and for the purposes set forth.

[For a further description of this, see another column.]

OIL CANS—Joseph Francis Berendorf, of Paris, France. Patented in France, May 21, 1856: I claim as my invention the construction of oil-cans provided with an internal cylinder and piston and a spring in the manner and for the objects substantially as described.

SPRINGS FOR RAILROAD CARS—J. C. Blair, of Pittsburg, Pa. : I claim a spring composed of a series of leaves or plates, so bent or curved, as that when piled one upon the other, the highest and lowest points of one leaf shall be in contact with the lowest and highest points respectively of the next adjacent leaf or plate, and so on throughout the series, substantially as described.

FURNACES—B. F. Blood, of Port Jackson, N. Y. : I do not claim the returning of smoke to a fire, either with or without oxydation, whether under the grate or into the flames, whether through the boiler or outside of the boiler, all of which processes are old and unpatentable.

Neither do I claim placing a fan blower either with in or without the smoke-box, smoke stack, or any chimney flue, for the above purposes or any of them.

First, I claim a scuttle, G, in combination with the flues of the boiler as heretofore described, as a protection, a guide, and a re-heater for the gases passing through the flues, substantially as set forth for the purpose specified, whether the said scuttle be made plain or indented, and whether it pass directly downward to the grate, or traverse some other portion of the inside surface of the fire-box.

Second, I am aware that David Matthew obtained a patent, May 15, 1855, for a pipe of less diameter than the inside of the base of the smoke stack, set up in the same and extending downward to the vicinity of the bottom of the smoke-box, having the exhaust pipes beneath it, and an annular space between it and the base of the stack, the whole designed to draw the smoke from the top of the smoke-box into the annular space and thence up the stack, and also to draw the sparks from the bottom of the smoke-box, lest they do injury thereto.

I do not claim such an arrangement, nor one that will effect the purpose for which he claims it.

I claim a downward bifurcated continuation of the smoke stack, without any egress from the smoke-box between this continuation and the base of the stack, and extending downward as far may be without disturbing those heavier sparks which may have fallen to the bottom of the smoke-box, into which bifurcations the exhaust pipes turn upward, the whole being designed, by closing egress for the smoke at the top, to give the sparks an opportunity to settle in the smoke-box or be returned to the fire through the nozzle, H, also to restrain the hot air and gas from immediately leaving the smoke-box at the top, at the same time that the legs, K, will select the matter of their draft from the cooler and lower instead of the lighter and hotter gases of the top of the smoke-box.

INSTRUMENTS FOR DRAFTING COATS—Simeon Corley, of Lexington, S. C. : I do not claim the invention of any of the measurements obtained by my instruments.

Nor do I claim separately considered the employment of a hoop or ring for obtaining measurements and applying the same to the cloth.

But I claim the triangle, D E F, having an arm, D', combined with the hoop or ring, A, substantially as described for the purposes set forth.

[By the employment of these instruments very accurate measures may be obtained, and from this system a perfect fitting coat can be made.]

DEFLECTING PLATES AND SPARK RECEIVER IN LOCOMOTIVES—Wm. H. Bullock, of Boston, Mass. : I am aware that a high blast pipe has been used, but it is found it is not practicable in coal-burning engines as now constructed, without a means substantially such as described for freeing the smoke arch, therefore I do not claim the high or elongated blast pipe, but I claim the reservoir, G, in connection with the elongated blast-pipe, F, substantially at set forth.

POTATO DIGGERS—I. S. Bunnell, of Montrose, Pa. : I claim the arrangement relatively to each other and for united operation of the oblique-hinged wings, D D, diagonal pivoted adjustable rakes, F F, pivoted adjustable rods, G' G', and double mold board plowshare, B, a a, substantially as and for the purposes set forth.

[With this implement the potatoes can be thrown up on either side of the hill, separated from dirt, the vines cleared away so as to leave the potatoes on the surface of the soil in regular rows, and the soil reduced to a condition for receiving seed for a succeeding crop.]

LIFTING JACKS—John Callaghan, of Stroud Glades, Va. : I claim the construction of a lifting jack, provided with series of perforations, c c c, c, and movable alternating fulcrums, d d e e, the double-notched lever, g g g, Fig. 2, combined with the chain, J J J K, and stay-hole, L L L, substantially as shown and in the manner described.

WASHING MACHINES—Thos. C. Churchman, of Sacramento, Cal. : I claim the construction of a washing machine combining a horizontal and perpendicular motion produced on the washboards, D and E, by the turning of the crank and shaft, A, and the running of the wheels, G G, in curved tracks, F, as represented and described.

CLAMP FOR SETTING SAWS—C. E. Cook, of Cambridge, O. : I claim the two V-shaped frames, A A, connected at one end by a hinge, a, or its equivalent, and provided with the bars, C D, the adjustable steel or metallic bar, b, provided with beveled edges and the bars or stops, h h, the frames being brought together by the screws, e, and nuts, f, the whole being arranged substantially as and for the purpose set forth.

[The object of this invention is to obtain a simple, cheap and efficient clamp, and one that will facilitate to a great extent the old plan of setting saws by means of a punch, a mode still continued by many mechanics.]

CONNECTING THE PANELS OF PORTABLE FIELD FENCES—John H. Bruen, of Elmira, N. Y.: I claim the button, e, in combination with the other devices described for locking and securing the panels of field fences in manner set forth.

SEEDING MACHINES—Wm. Coggeshall, of Massillon, Ohio, and B. B. Warner, of Wadsworth, Ohio : We do not claim the alternate arrangement of seed cavities in the seed roller, so as to produce a corresponding deposite of seed in separate adjacent rows or drills, being aware that such is not new.

We claim the levers, U V, respectively bearing the removable and replaceable gear wheels, S T, when arranged, operated and combined together, and in combination with the gear wheels of the seed rollers and the driving wheel, substantially in the manner and for the purposes specified, disclaiming all other combinations of levers and gearing not essentially the same as set forth.

MACHINE FOR SAWING HAND RAILS OR STAIR WREATHS—John Davis, of Cincinnati, Ohio : I am aware that it has been proposed to produce stair-rail wreaths by presenting the plank from which they are to be sawn at an oblique angle with the axis of rotation of the saw equivalent to that afforded by the longitudinal adjustment of my clamp stocks, K K', or their equivalent.

But I claim, first, Providing what is technically known as "spring" in the rail by presenting the sides of the plank (that is to say, the cutting planes of the warped surface) acutely or obtusely to the plan of adjustment of the clamp stocks, K K', or their equivalent.

Second, The described construction and arrangement of the hinged jaws, M M', m m, and their accessories, n o p, operating as explained in combination with the adjustable clamp stock, K K'.

RAILROAD CAR CARRIAGE SPRINGS—George Douglass, of Scranton, Pa. : I do not claim broadly the causing of one leaf of a spring to overlap another. An example of this is seen in the device of S. S. Barry, rejected 1852, in which the ends of the upper spring overlap those of the under spring, the two ends fitting together on the tongue and groove plan.

The employment of the tongue and groove avoids the necessity of eyes and bolts to connect the ends of the springs, in other respects, the above plan resembles the elliptic spring, the weight being applied in the middle of the upper and lower leaves.

My improvement is quite different, as the upper leaves serve chiefly as horizontal chords to prevent the too wide opening of the lower leaves. The strain upon the upper leaves is chiefly in a horizontal direction.

Nor do I claim the broad idea of suspending the load upon the ends of elliptical springs.

But to the best of my knowledge it is a new feature in elliptical carriage springs, so to arrange them as that one set of the leaves shall serve as horizontally elastic chords to prevent the under opening of the other set of leaves.

I claim as a new article of manufacture, a carriage spring made substantially as set forth.

[This improvement relates to that kind of spring known as "elliptic," and consists in a novel mode of constructing and combining the upper and lower plates of the spring, whereby greater strength is obtained with a less weight of metal that is required in the ordinary method of construction.]

BURGLAR-PROOF SAFES—Leopold Eidlitz, of New York City : I claim forming an improved burglar-proof plate (or its equivalent) by the union of an outwardly chilled hardened layer of molten iron with the ribbed surface of a zig-zag sheet of iron substantially as set forth.

DEVICE FOR ATTACHING LIGHTNING RODS—J. B. Elliott, of Philadelphia, Pa. : I do not claim forming a conductor of corrugated metal strips or plates, for they have been previously used.

Neither do I claim serrating or notching the edges of the strips which form the conductor, nor do I claim the manner of connecting said strips.

But I claim connecting the conductor to the building by means of the wires, g g', bent as shown, and secured in the head of the spike or nail, i, for the purpose set forth.

[This is described on another page.]

DRY SAND CORES—Wm. Gage and Richd. B. Felthonsen, of Buffalo, N. Y. : We are aware that flour in a dry or unprepared state has long been used in the composition of dry sand cores, we therefore disclaim its application or use in this well known way.

We claim the application and use of the viscous substance, or paste, which we obtain from flour, in the manner described, in admixture with sand, for the purpose of forming dry sand cores, in the manner set forth.

WASH-BOARD—Wm. M. Galusha and B. W. Safford, of Arlington, Vt.: We do not claim broadly, the employment or use of a corrugated sheet metal plate, for the rubbing surface of a wash-board, for they have been previously used.

But we claim corrugating the sheet metal plate in the form specifically as shown and described for the purpose set forth.

[This wash-board, from the peculiar form of the corrugation, affords a good surface for rubbing, and also allows the water to run away without splashing.]

LOCOMOTIVE ENGINE WHEELS—G. S. Griggs, of Roxbury, Mass. : I do not claim the introduction of wood between the rim and tire of locomotive and other railroad wheels.

But I claim confining the blocks of wood upon their sides, in the manner substantially as described, for the purpose of preventing them from being forced out and destroyed, as set forth.

MACHINE FOR SAWING SHINGLES—George Hall, of Morgantown, Va. : I am aware that a rocking bed has been used for this purpose, but my horizontally moving carriage does not rock in any manner.

I claim, in combination with the horizontally reciprocating carriage, C, for carrying the bolt to the saw, the transverse carriage, I, also moving on horizontal ways, but provided with ribs, n n n, so arranged as that the block or bolt dropping upon them shall be held in the proper position for alternately changing the point and butt of the shingle, and for giving the shingle the proper thickness and taper as set forth.

SPRING BOTTOMS FOR BEDSTEADS—Royal Hatch, of Strafford, Vt. : I claim stretching the sacking bottom, G, upon springs, F, all in the manner substantially as described.

[The bottom of this bed is of sacking attached to the ends and sides by means of spiral springs, so that a perfectly elastic bottom is obtained in a simple and cheap manner.]

MOORING VESSELS—A. W. Handcock, of Allegan Co., Mich. : I claim mooring a vessel during foul weather, by means of two hawsers, B and C, payed out at the usual bow hawser hole, and at the hawser hole, D, which I especially construct abaft the forechains, whereby a bow anchor, and a waist anchor are arranged and operated substantially in the manner and for the purposes set forth.

TOOL FOR TURNING JOURNALS—James Hall, of New Haven, Conn. : I do not claim to be the first inventor of a revolving cutter stock for turning journals, as I am aware that such a contrivance has been used for turning a crank and other articles.

But I claim the combination substantially as described of the divided hollow cylindrical cutter box, A A, furnished with ratchet teeth on its exterior, and tightening screws, b b, and the divided ring, c c, handle D, pawls, g g, and fastening screw, f, the whole operating as set forth.

[A notice of this will be found on another page.]

BLACKSMITHS' TONGS—Wm. Hart, of Mayville, Wis.: I claim constructing the tongs with revolving jaws, B B, placed or fitted in the shanks, b, substantially as described for the purpose set forth.

[By these tongs having revolving jaws, they will grasp articles of different sizes and taper form with surety and ease.]

WATER CLOSETS—J. T. Henry and Wm. P. Campbell, Pa. : Disclaiming the discharging of a stream of water into the pipe communicating with the basin from a cistern, the level of water, in which is the same as that required in the basin when the valve is closed, as such a device is shown in the English patent of John Ody, sealed May 13, 1855.

We claim the chamber, D, with its valve, d, in combination with the pipe, C, of the basin, C, the cistern, E, and communicating pipe, F, when the same are constructed and arranged in respect to each other, in the manner set forth and for the purpose specified.

BALANCES FOR DETECTING COUNTERFEIT MONEY—Ferdinand J. Herpers, of Newark, N. J. : I do not claim to be the inventor of swinging index bars for weighing machines, and therefore I disclaim the same as used in my apparatus. Their employment is not essential, as my instrument can be made and used either with or without the same, as may be desired.

I claim as a new article of manufacture a coin balance, when constructed as described.

[This is described on another page.]

GUIDE GAGE FOR SAWING TIMBER—Jacob Hoke, of Grand Detour, Ill. : I claim the graduated squares, A, constructed as shown, and provided with slides, c, also graduated and arranged as and for the purpose set forth.

[Full particulars of this invention will be found in another column.]

MOWING MACHINES—Silas E. and Morgan P. Jackson, of Booneville, N. Y. : We claim counteracting the side draft of a harvesting machine by attaching the power that draws it to the uncontrolled end of a chain, the other end of said chain being attached to the lower end of a stud or bar, located and arranged with regard to the frame, as described.

MOWING MACHINES—Silas E. and Morgan P. Jackson, of Booneville, N. Y. : We do not claim a raising wheel and lever as generally applied to harvesting machines.

But we claim the combination in harvesting machines having but one main supporting wheel, the finger bar resting on the ground and supported by braces connected with it and the main frame of the machine, of the hinged lever, E, and hinged axle, F, with its wheel, I, when arranged and located in relation to the rear cross piece of the frame and the driver's seat, substantially as described.

THROWING INTO AND OUT OF GEAR THE TOOL OF MORTISING MACHINES—Levi Kittinger, of East Greenville, Ohio : I am aware that a hollow chisel containing an auger has been previously used, and also connected to a sliding gate, and I am also aware that said parts have been placed in adjustable frames. I therefore do not claim the above parts.

But I claim operating or adjusting the two parts, e f, by the nut, R, by means of the oblique bars, h h, connected with the parts, e f, and used in connection with the catch, S, for the purpose specified.

[A full description and engraving of this machine will be found on page 97, present volume of the SCI. AM.]

SEEDING MACHINES—James Lawson, of Lawrence, Mass. : I do not claim the wheels, M, for forming the furrows, for they have been previously used.

Nor do I claim the two frames, A F, arranged as shown, for they have also been previously used.

But I claim operating the marking device formed of the bars, S S, and the slides, I, by means of the cams, P, with pins, r, attached, when said cams are placed on the hollow shaft, E, which encompasses the axle, D, and is connected therewith by means of the nuts, a, fitted on the slotted ends of shaft, E, whereby the dropping and marking devices may be regulated as described.

[This invention has a device for forming the furrows, regulating the distributing device, and throwing the whole in and out of gear at the will of the operator.]

HOES—Horace A. Lothrop, of Sharon, Mass.: I do not claim a hoe made with a single triangular blade.

Nor do I claim one as made of a single blade, having two opposite parallel edges and a triangular notch, whose opposite side and the parallel edges of the hoe plate form boundaries of two teeth extending from the plate

But I claim an improved manufacture of hoe, or one having its blade composed of two or more separate isosceles triangular plates or teeth, each being lapped on or connected to that next to it at their two corners, and each being supported by a separate prong of a furcated shank, as described.

PREPARING PLASTIC COTTON—James M. Legare, of Aiken, S. C. : I claim the process of rendering cotton and other fibrous materials, including lignines of all kinds, plastic, and capable of being worked by hand or applied to roofing, and other kindred uses, in the manner and for the purposes set forth in the specification.

HARVESTERS—John Long, of Masillon, Ohio : I am aware that cranks and cam wheels have been used in mowers and reapers for driving the vibratory knife bar, and being old devices, do therefore not claim them.

But I claim giving the cutter bar, g, the vibratory motion by two complex spur wheels, L1 L2, in combination with the reciprocating shaft, 2, the whole being constructed and arranged in the manner and for the purposes set forth.

SEED DRILLS—Jacob Mumma, of Harrisburgh, Pa: I claim the combination of the broad-casting apparatus for sowing pulverized manures with the seed drills, when the former is placed in advance of the latter, the whole being arranged and operated in the manner and for the purposes specified.

GRINDING MILLS—Franklin Olds, of Providence, R. I. : I do not claim to be the first inventor of mills in which the upper stone was made adjustable. But so far as I am aware, no grinding mill has ever been made in which the upper stone is held and adjusted in the manner described by me. Nor has any mill been made which contained the several other features of novelty which I have set forth.

But I claim a grinding mill made substantially as set forth.

[In this improved grinding mill the parallelism of the stones is preserved, and the spindle prevented from being subjected to any lateral pressure. The rotating stone can be readily adjusted and maintained at any distance from the stationary one.]

ROTARY PUMPS—Oliver Palmer, of Buffalo, N. Y. : I claim the pistons, B B2, constructed as described, in combination with the metallic packing, C, operated as described, said pistons and packing revolving together in the manner and for the purpose set forth.

DOOR SPRING—Charles P. Peck, of New York City : I claim the employment of a variable bearing roller, j, as described.

[This spring provides a variable power, decreasing as the door is brought nearer to the frame, so that it may be shut without banging or clash.]

JOURNAL BOXES FOR RAILROAD CARS, &C.—James A. Norris, of Philadelphia, Pa. : I claim the combination of an ordinary gland and stuffing box with the journal box of a railroad car, whereby the oil is retained, and the admission of the dust rendered impossible, the whole constructed and arranged as and for the purpose specified.

MACHINES FOR BINDING GRAIN—Lodner D. Phillips, of Chicago, Ill.: I claim the circular revolving platform n, in combination with the rake, d' d' d', and apron, e', for the purpose of gathering the grain and conveying it to the binding receiver, i' i' i'.

I also claim the construction and combination of the grooved arms, S' S', with the slotted lever, k', for the purpose of carrying and crimping the band and compressing the staiks in proper shape for binding.

I also claim the construction and arrangement of the apron with straps and pins, v', in combination with the box, d e f g, for the purpose of feeding the binding clamps with bands taken from the mass of straw placed in said box, one at a time.

TRACK-CLEARERS FOR MOWING MACHINES—Abraham Marcellus, of Amsterdam, N. Y. , I claim the vibrating clearer, C, and adjusting spring, E, in combination with the wing, B, divider, a, and operating wheel, F, said parts being constructed and arranged in relation to each other, as and for the purposes set forth.

[By means of a vibrating plate or knife, this machine, as it is pushed along the track, cuts all the long grass, and clears the track.]

ROTARY STEAM ENGINES—John B. Root, of Youngstown, N. Y. : I claim the arrangement of means for operating the oscillating abutment and the valve, as set forth.

RAILROAD CAR COUPLING—John F. Rague, of Dubuque, Iowa : I do not confine myself to any particular mode of operating or rotating the hooks, E, for that may be done in various ways.

But I claim the rotating or revolving hook E, in combination with the buffers, K, the above parts being placed within the draw head and arranged as shown for the purpose specified.

[By this invention the cars are not only made self-coupling, but the brakeman can uncouple them when running at any speed. It consists in the employment of a revolving hook placed within the draw-head, and in conjunction with a buffer also placed within the draw-head.]

MAKING VOLUTE SPRINGS—Daniel G. Robbin, of New York City : I claim the combination of a conical roller with a mandrel, so as to coil a volute spring, as set forth.

I also claim the combination of two conical rollers moving in opposite directions, with a double conical mandrel, so as to coil a double volute spring at one operation.

I also claim directing the coiling of the plate into a volute spring, so as to cause it to assume the desired conical form by means of the volute upon the conical roller, which volute is turned in a direction the reverse of that in the spring to be formed.

JOINTS FOR CARRIAGE TOPS—A. C. Shelton and Byron Tuttle, of Plymouth, Conn. : We claim providing the lower ends of the arms, A B C D, with circular plates, a b c d, and shoulders, e, said plates being so arranged as to constitute a barrel over which the shoulders, e, may move, said shoulders giving support to the arms, A B C D, all as described.

[This is an extremely simple and durable joint, and is applicable to any top which is formed of bows.]

CIDER MILLS—H. O. Sheidley, of Republic, Ohio : I claim the hollow stem, d, in communication with the interior of the curb, in combination with the follower and curb, substantially as and for the purposes set forth.

I also claim the combination of the cap piece, G, ratchet piece, I, ratchet, r, with its cheeks, g g, cam lever, L, and secondary levers, l l, arranged and operating as set forth.

PORTFOLIOS—Henry T. Sisson, of Providence, R. I. : I claim the cords, d, passing through the strips or plates a a, and attached at one end to the slides, B, fitted or placed within the guides, C, or any equivalent device for tightening the same, and the opposite ends attached to needles, e, which pass through perforations in one of the strips, a, as shown and described for the purpose set forth.

[This portfolio is especially applicable for preserving music, pictures, or periodicals, as fresh ones can easily be placed in it, from time to time, without disturbing or damaging those already in.]

COTTON PRESSES—Riley Smith, of Towanda, Pa. : I claim so combining a set of falling weights, or their equivalents, with a movable cotton or pressing box and its levers, as that when the united force of said weights is applied to said box, it shall start it up, and draw in its levers, and admit of a better application of the first moving power of the press, as set forth.

I also claim the so applying of the ropes or chains that draw down and force up the pressing box to the follower, as that the slack of one shall lead or be in advance of the winding up of the other, as set forth, and for the purpose explained.

I also claim the application of the roller, T, with its eccentric, w, and pins, 1 2 3, for the double purpose of a fastening to said door, and as a means of tightening up the bale ropes, as set forth.

HARNESS SADDLES—Richard Swift, of New Haven, Conn. : I claim the method of adjusting the pad of the harness by means of the male screws on the turrets, working in the female screws of the arms of the yoke, so as to spread the pad by elevating the arms in the boxes, or contract it by depressing them, when the whole is constructed, arranged and made to operate as described.

GOVERNOR FOR STEAM ENGINES—H. N. Throop, of Pultneyville, N. Y.: I claim the combination, A, or their equivalents, the expanding segments and links constituting the expanding rim, and the springs to operate as described.

[A description of this invention will be found on another page.]

HEAD-RESTS—Elisha Waters, of Troy, N. Y. : I claim the within-described folding portable head-rest for car and other seats, when made adjustable in, on, or by a strap buckled or otherwise fastened to the back of the seat, as set forth.

SEED PLANTERS—L. F. Ward, of Marathon, N. Y. : I claim the combination of devices for operating the plunger to deposit the seed automatically, consisting of the marking cogs, J, the lever, H, pins, I, and spring, k, constructed and arranged as described.

LOCOMOTIVE ENGINES FOR PRODUCING INCREASED ADHESION TO THE RAILS WHEN REQUIRED—Franz Windhausen, of Duderstadt, Hanover: In combination with the exhaust steam pipes of locomotive engines, I claim the apparatus described for drawing from the smoke box and forcing upon the rails in front of the driving wheels, the products of combustion, when said apparatus is revolved to operate by the reaction due to the escape of steam from the cylinder, substantially as set forth.

I also claim the arrangement described for regulating the supply of hot air, smoke, and other products of combustion upon the rails, by causing the draft either through the chimney, D, or the pipes, E, or both the chimney and the pipes, substantially in the manner specified.

PUMPS—Francis G. Wynkoop, of Corning, N. Y. : I claim the combination of seat, f, loose piece, h, and rubber packing, r, as set forth.

ROTARY PUMPS—William A. Young, of Charlotte, N. C. : I am aware that sliding pistons have been fitted in rotating heads placed eccentrically within cylindrical caves or boxes, and arranged in various ways, said devices being employed both for rotating pumps and rotary engines. I therefore do not claim broadly, the em-

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ployment or use of sliding valves or buckets placed within a head fitted eccentrically in a case or box.

But I claim placing the sliding valves or buckets, F, within the rotating head, D, tangentially with its shaft, E, or tangential with a circle concentric therewith and with the head, the head being placed eccentrically within the bar or case, A, which is provided with the induction and eduction passages, a b, as and for the purpose set forth.

I further claim the curved projections, h, at the outer ends of the valves or buckets, F, as and for the purpose specified.

[This pump is intended to be submerged, and is operates by means of a series of valves or buckets placed within a circular rotating head, which is placed eccentrically within a cylindrical case or box, whereby the valves are made self-acting, and a very efficient pump is obtained.]

HARVESTERS—Walter A. Wood, of Hoosick Falls, N. Y. : I claim so filling up the space between the forks or hounds of the tongue with the castor block, to which the castor wheel, R, and lever, S, are attached, as that, by the introduction of a rod that passes through them, as at g, they may be made rigid, and serve to support each other, in turning the machine, in the manner and for the purpose set forth.

HARVESTERS—Walter A. Wood, of Hoosick Falls, N. Y. : I claim so constructing the frame of a combined reaping and mowing machine, and combining it with a spring track-clearer, as all that part of the frame in rear of the cutter-bar may be disjointed and removed by simply taking out the bolts, m n t, said track-clearer remaining attached, for the purpose of adapting the machine to the cutting of tangled or lodged grass, without obstruction, whilst the machine, with the driver upon it, remains perfectly balanced, as set forth.

POTATO DIGGERS—Alexander Anderson, of Markham, Canada : I claim the opening shares, 8 and 6, and the share or shovel, 7, 9, and 3, in combination with figures, 4, and revolving toothed cylinder, 8 and 2, for the purpose of digging and separating potatoes from the soil, the whole being constructed and arranged as described.

CIRCULAR SAWING MACHINES—E. H. De Witt, (assignor to himself and Butler N. Strong,) of Xenia, Ohio : I am aware that vertical and horizontal saws have been previously used, and also a combination of reciprocating and vertical saws have been used for the purpose described. I therefore do not claim the employment of a horizontal and vertical circular saw separately or irrespective of their arrangement as shown.

I claim the construction of sawing machines in the manner described, viz., having one of the circular saws, J, arranged vertically, and the other circular saw, H, arranged horizontally, both saws cutting simultaneously, and being carried in adjustable frames, C D, all as set forth, for the purposes specified.

[This sawing machine cuts vertically and laterally at the same time, by using two circular saws, set at right angles to each other, and rectangular pieces, such as laths, can be cut at one operation. It saves time and labor, and cannot but prove a valuable acquisition to lumber-sawing.]

PAINT COMPOUND—John M. Mertymon, of Logansport, Ind., (assignor to himself and J. H. Jordan, of Attica, Ind.) : I claim the combination of quicklime and resin for a paint material, in the manner for the purposes set forth.

COVERING THE HEADS OF NAILS—William H. Van Gieson, (assignor to himself, S. M. Buckingham and E. Brown,) of Waterbury, Conn. : I do not claim the cutting out and bending from the center outwards of disks of metal for the purpose of making grummets, as in the patent of John Alexander, June 20, 1854. A piece of metal cut in the form necessary for a grummet could, by no possibility, be made to cover a nail head.

But I claim a nail covered in the manner substantially as described.

[The plates which are to cover the nail heads are first cut in a star or pointed form, and afterwards swaged into a dish shape; they are then placed on the nail heads, and the points turned under, thus forming a strong and good cover.]

STEAM SPRING BEDSTEAD—Charles T. Young, of North Chelmsford, Mass., (assignor to himself and Henry Crowther, of Lowell, Mass.: I do not claim constructing bedsteads of metallic tubing, as such is old and well-known.

I claim the rods, I, connected to the end rails, N, when these rails, and the side rails, A, are connected by a common coupling to the bed post, arranged as and for the purposes set forth.

ADDITIONAL IMPROVEMENT.

SELF-ADJUSTING SACK-HOLDER—Augustus Stoner, of Mount Joy, Pa. Patent dated April 28, 1857 : I claim the cast iron clamp or clasp, and its adjustment, as set forth.

[A GOOD FORTNIGHT'S WORK FOR THE HARD TIMES.—The number of patents issued from the Patent Office for the past two weeks, exclusive of designs and reissues, amounts to *one hundred and twenty-one.* Of this number, *forty-six* of the cases were prepared at the Scientific American Patent Agency, showing that more than one-third of the whole number of cases which are successfully prosecuted through the Patent Office are conducted through the principal and branch offices of MUNN & Co.]

Tennessee Iron.

MESSRS. EDITORS—I think that one very important feature in the local history of East Tennessee might ask a place in the columns of your scientific journal. I allude to our massive metallic deposit; not, however, to our copper, but, I refer to our almost inexhaustible beds of iron, which I regard as of greater value than any other metal, inasmuch as its use is so much more extensive and practical. Heretofore, comparatively, we had little use for iron ; but since it has been found necessary to bind the *world* together with "iron hoops"—to build iron houses, iron vessels, &c., IRON has become more valuable than gold or silver.

From my cottage, in the town of Kingston, at the juncture of the Clinch and Tennessee rivers, I look out on a place designed by nature for a great manufacturing city. East, west, north and south, we have hills and even mountains of superior iron. Indeed, we have iron enough to iron all the roads of the United States; and after that to build cities of iron. In connection with our iron mines, we have in East Tennessee, and within range of sixteen miles of Kingston, plenty of coal of a superior quality. In addition to this, we have excellent forests of convenient timber—oaks, ash, hickory, sugar-tree, pine, elm, poplar, &c. Yet our excellent and extensive resources for manufacturing purposes remain almost wholly undeveloped. 'Tis true, thousands of tons of iron (pig-metal) have been shipped from East Tennessee to Cincinnati and elsewhere, (at a profit to them, our iron men say,) much of which has been re-shipped in the form of nails &c., for which we pay a handsome price. But why not have our iron worked into the many valuable articles of commerce at home? It would be not only to our advantage, but to that of the great public. The question is, why? Here is the answer: We have not only the aforesaid valuable mineral resources, but along our winding rivers, and around our mountains of iron, we have superior agricultural districts. yielding grain sixty to one hundred bushels of corn per acre, and other grains in comparative proportion. Men of capital have invested their means in lands which yield immense profits, and therewith they are content. The mechanics of our country, on the other hand, are men of limited means; and hence, our mammoth treasure is allowed peacefully to slumber in its bed, and whilst it thus slumbers, thousands of well-balanced mechanical heads—so to speak—are rusting, waiting for the sound of a hammer to arouse them.

The inhabitants of our mountain home have, it is true, grown wealthy by tilling the soil, and are yet adding rapidly to their handsome fortunes by that noble pursuit—agriculture; but as a great portion of their success is the result of aid extended by inventive genius and mechanical skill, it is desirable that the field for those valuable auxiliaries shall be fully opened—a field (the mechanic's) in East Tennessee in which has been deposited, by nature's hand, the choicest seed.

N. A. PATTERSON.

Kingston, East Tennessee, Dec., 1857.

[The above communication exactly hits the right nail on the head, namely, that men will not spend their time and labor in an unprofitable pursuit, and so long as agriculture is more profitable than mining, so long will the vast iron resources of our country be unworked; but when agriculture moves away from those localities where metalliferous deposits are found, then will they begin to be worked and their true value appreciated. When that time comes, and not until then, will the riches of Tennessee be developed.—ED.

The Odors of Minerals.

So accustomed are we to associate odors with plants and flowers that we can scarcely appreciate the fact that certain minerals and ores give off, under certain circumstances, a distinct and characteristic odor.

If an ore of arsenic be rubbed until it becomes slightly heated, a distinct smell of garlic will be observed, which, on heating the substance before the flame of the blow-pipe, becomes still more apparent. This odor, which is characteristic of the compounds of arsenic, is termed alliaceous.

When selenium or a selenide is strongly heated, a distinct smell of decayed horse-radish is perceived. This smell, which is peculiar to burning selenium, is known as the horse-radish odor.

The odor proceeding from burning sulphur, or the roasting of a sulphide, readily reveals the presence of that substance, and is termed sulphureous.

When certain varieties of quartz and limestone are strongly rubbed, they give off the odor of rotton eggs. This peculiar smell is occasioned by the evolution of sulphureted hydrogen; and substances which possess this property are termed fetid.

Clays and other substances containing large quantities of alumina afford a peculiar odor when breathed upon; whilst a few, such as pyrargillite, present the same phenomena when heated. This odor is termed argillaceous, and may frequently be observed in the open air, just as the ground begins to get moistened by a shower.

Construction of Dams.

In a letter on the above subject from J. W. Truax, of Bickford, Vt., he states, that vibrations in some dams are caused by their imperfect construction, they generally not being sufficiently strong. This was the case with the dam in that place. Part of it was carried away by a freshet in February, 1857; this was repaired under Mr. Truax's superintendence, but not sufficiently, as he had not time to do so, owing to a second rise of the river. When after this, the water flowed over the dam twenty-four inches deep, vibrations were discovered for the first time, and they were so severe as to jar all the windows in the neighboring houses. When the question arose as to the cause of this, he replied that it was owing to the imperfect condition of the dam. In the month of June last, when the state of the river permitted, he examined the dam thoroughly, and found that his surmises were verified. He had the dam thoroughly repaired, and since then the vibrations have ceased. Vibrations in dams, therefore, are produced by more than one cause; but this still confirms our former opinion, that they can be prevented by the proper construction of dams.

Recent P Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims on another page :—

COUNTERFEIT COIN DETECTORS.—This detector is a combination of a measurer and weigher by which means a coin, on being put in its proper place, can instantly be known, whether it is good or not. It is the invention of F. J. Herpers, of Newark, N. J.

TOOL FOR CUTTING LOCOMOTIVE JOURNALS.—This tool is a useful little implement, consisting of semi-circular cutting bits, which are clasped round the journal to be cut, by a brace and ratchet handle, and as they are worked round they gradually form the journal in a neat and expeditious way. It is the invention of J. Hall, of New Haven, Conn.

SAW MILL.—This invention provides a guide for the saw at its upper and lower end, fore and aft, in such a manner that the saw has no chance to buckle. The invention also provides a simple means whereby all the feed rollers can be adjusted together laterally, so as to saw different thicknesses of boards, and when adjusted can be retained so without clamping or using any auxiliary hold-fasts. D. B. Bartholomew, of Lancaster, Pa., is the inventor.

DEVICE FOR SQUARING LOGS.—This invention consists in the employment or use of a square, properly graduated, each arm being provided with a graduated slide, and these parts are so arranged that the log or stick of timber may be at once marked on the four sides if necessary, without any further adjustment of the squares after fitting them to the log. It is the invention of Jacob Hoke, of Grand Detour, Ill.

LIGHTNING CONDUCTOR.—J. B. Elliott, of Philadelphia, Pa., has invented a new conductor of corrugated copper, the object of which is to facilitate the equalization of the ascending and descending current, so that the conductor will act in the most efficient manner, as regards capacity or conducting power; also to so connect the parts of the rod that perfect joints are made, and a direct and unbroken communication is always maintained throughout. The conductor is firmly attached to the building, due allowances being made for loosening by the atmospheric changes, and perfect insulation always maintained.

GOVERNOR FOR STEAM ENGINES.—Captain H. N. Throop, of Pultneyville, N. Y., has invented a new governor, which consists in a wheel with a series of connected segments so applied as to be capable of moving from and towards its center, or, in other words, to form an expanding and contracting rim, and combined with a spring or springs acting in opposition to the centrifugal force generated in the expanding rim by the rotation of the wheel. The rim extends from the axis as the velocity increases, and draws nearer as the velocity diminishes; by this means, through suitable mechanism, it can be made to act on a regulator, and will work in any position of the axis, thus possessing a great advantage over the common ball governor.

The following inventions and improvements were patented last week, but we were unable to publish these notices until the present opportunity :—

SUBMERGED ROTARY PUMP—An improvement has been invented by H. Lindsay, of Ashville, N. C., on a submerged pump, an engraving of which appeared on page 310, Vol. XI, SCIENTIFIC AMERICAN. A cylinder with two pistons is placed at the bottom of the well, and a long pipe passes up to the top of the well to conduct the water as fast as forced up by the pistons. The power is applied by revolving the hollow shaft through a crank in the upper end of the the same. As the shaft revolves, the cylinder and pistons move with it, and in their movement the pistons are alternately forced in and out by means of an eccentric and moving ring, at the center of the well, instead of by means of stationary inclined planes at the circumference of the well.

PHOTOGRAPHIC PICTURES—This invention consists in flowing wax or varnish over the front side of a glass tablet which has a portrait on its back side, and rubbing said varnish down so as to give the glass tablet a semi-opake granular appearance, similar to canvass and thus destroying the glaze of the glass and imparting to the picture an atmospheric relief. The wax or varnish coating also provides a surface for the artist to paint drapery upon, after the portrait is finished. It was invented by E. C. Hawkins, of Cincinnati, Ohio.

ATTACHMENT OF PUMP TO OSCILLATING ENGINE.—The novelty of this invention is the formation of the pump in the side of the engine cylinder and having the piston of the pump operated by the same crank that moves the engine piston. In order to apply this improvement, the trunnions of the engine cylinder are made hollow, and furnished with suitable passages and cut-offs. The inlet and discharge of the water, and the induction and eduction of the steam, is effected through the two trunnions, without the use of any auxiliary valves. It was invented by G. Sprenkel and T. W. Basford, of Harrisonburg, Va.

USING EXHAUST STEAM.—This invention consists of a circular rotating valve or wheel with four or more eccentric pistons, and an equal number of oscillating cylinders. This valve is arranged within the steam chest and has its pistons perfectly balanced by the steam pressing on all sides equally. The pistons and cylinders pass through a channel which receives the exhaust steam, and the cylinders being open receive and lift it past an abutment from which it is discharged into the steam chest, where it is used for driving the engine. This invention will answer well as a boiler-feeder, or for feeding any fluid into a chamber against the pressure of steam. It is the invention of Lewis Martin, of New York.

SCREW CUTTER.—This invention consists in confining the dies by means of eye-screw bolts—so that each one may be removed separately, and that the screw thread may be cut entirely up to the head of the bolt. Another feature of this invention consists in having the chuck-plate tubular and open at its periphery, so that a current of air may circulate round the screw bolt and thus keep the bolt cool and prevent an unequal expansion of the thread. And a third feature is the formation of oil reservoirs in front of the die-chuck, so that the oil is automatically and regularly supplied to the dies or cutters. It is the invention of Wm. Kenyon, of Steubenville, Ohio.

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New Inventions.

New Apparatus for Collecting Night-soil.

The London *Engineer* publishes the accompanying engravings of a new and highly useful method of collecting and utilizing the night-soil which is now discharged by the house drains of cities and towns into the main sewers, and thence passed off into an adjacent river, by which the stream is polluted and the night-soil wasted.

The illustrations show the apparatus proposed to be employed for carrying the invention into effect. At or about the lower extremity of the vertical discharge pipe of water-closets is placed in connection with the pipe in such position in the house and premises that it can be conveniently got at for examination and use, a chamber, constructed as shown in section in Fig. 2, and side elevation in Fig. 3, the cover being removed. A is the vertical pipe from the chest; B, the chamber; C, a shaft with cross-arms, at one and a half, two, or three inches asunder, forming a grating across the chamber when the shaft is stationary, so that no extraneous or foreign matter or thing thrown into the closet beyond the size of the opening of the grating can pass through, while the soil and water and paper will have sufficient space for that purpose. A lever handle is attached to the shaft, so as to give power of setting it in motion by hand from the outside, and if it be found that any stoppage has taken place in the pipe or chamber, the handle is used to make the cross-arms on the shaft traverse round the chamber, by which means any slight obstruction, such as the clogging by paper, &c., will be removed or broken up, so that it may pass away; the breaking up of such matter being caused by the arms passing through a grating attached to the side of the chamber standing in an angular position, as shown at D, and the angular grating will hold at its upper side any other matter which is not sufficiently small to be forced through it by the action of the revolving arms on the shaft. If it be found that the lever handle has not power to force the arms round, the chamber must then be opened, which is simply done by unscrewing a couple of thumb screws by which the side is attached, and the obstruction within is removed.

By this means the chance of stoppage in the pipes intended to carry away the excretory matter from closets will be considerably lessened, and the inhabitants of houses have the power of removing obstructions. The vertical pipe below the chamber is connected with an inclining pipe made of any sufficiently strong and air-tight material, metal, iron, stone, earthenware, &c., so as to be air-tight, and running from the house to a pipe or main drain to be placed in all the existing sewers, and which pipe is proposed to be also made of any sufficiently strong and air-tight material, and to be called the "house refuse main." This "house refuse main" it is proposed should be placed in the center of each existing sewer, as shown in the illustration, Fig. 1, which represents a street in cross section; A′ A′, being the "house refuse main," supported by brackets in a position so as not to interfere with the flow of the surface water, and the discharge from the kitchen drains of houses, &c. With these "house refuse mains" all water-closet pipes should be connected, by which means no excretory matter would be discharged into the general sewer, and all the evil now experienced from the collection of such matters in the sewers, and the discharge from it of noxious gases, so destructive to human life, would be prevented. These "house refuse mains" should be made of such dimensions as would be proportionate to the quantity of matter to be passed through them, and they should be concentrated (according to circumstances and the natural fall or water shed of the locality) by degrees into one main, discharging at the principal sewer mouth, wherever it might be; the length of pipes or "house refuse mains" discharging at one point being regulated by the nature of the locality to be drained, and the joints should be made so that they could be readily disconnected and made air-tight when connected again.

At the point of discharge is placed a chamber, which the patentee calls the "filtering vacuum chamber," the construction of which will be seen in the vertical section, Fig. 4. This chamber is built up of cast or wrought iron plates which are bolted together, and is made of sufficient strength to resist atmospheric pressure from without whenever it may be found necessary to produce a perfect or partial vacuum in it, and of a size proportioned to the quantity of matter and water to be passed into and through it. Into this chamber is discharged the whole contents of the "house refuse mains" at such level as would be found suitable to the rise and fall of the river into which the main sewer emptied itself. Within the chamber, A, A, is constructed a filtering bed, B B, composed of peat charcoal, or other equally filtering substance, the whole disposed in layers or beds in such quantities or proportions as would be suitable to the extent of sewage water to be passed through it. The water and matters from the "house refuse mains" would fall into the filtering or vacuum chamber in or about the position shown in the illustration of the chamber, and the weightier solids would naturally precipitate towards the bottom, but the general liquid gradually rising to its own level would pass up through the grating, C, and traverse through the filtering bed, B, rising up a second grating, D, or a water and pump shaft, and discharge itself through one or other of the tide valves, E and F, according as the river would allow; the number of tide valves must be such as is found desirable for the locality. Thus the filtering bed would prevent the passage of any solid matter, and absorb (by means of the affinity existing between the preparations of peat moss described and the impurities existing in the sewage) that most injurious noxiousness which is now imparted to rivers by the discharge of sewage matter into them, and the use of which preparations for such purpose has already been secured by the patentee. The tide valve is specially constructed so as to prevent the admission into the filtering and vacuum chamber of exterior water. It will be seen by the illustration that it is something resembling the port-hole of a ship, but it is hinged from below, and rises upwards to close the hinge, being made water-tight by an india-rubber covering; and at each side are quadrants, which work in a close groove formed in the framing into which the valve shuts; the effect of which is, that water cannot enter at the sides of the valve when open, but must pass over the valve front or door, hung on a hinge below. On this valve front or door is secured a float, for the purpose of causing the water as it rises from without to lift the valve and keep it floating on the surface. Thus, as the water rises, the valve closes and becomes perfectly water-tight by the lateral pressure from without; while, when the water commences to fall, so does the valve, allowing the water from within to pass away. By this means water cannot enter the filtering chamber from without; and inasmuch as its area is in all instances to exceed the area or contents of the whole extent of "house refuse mains" discharging into it, it will be found that the quantum of liquid matter usually to flow from water-closets will never exceed or equal the space provided in the filtering chamber for its reception and storage till the fall of tide permits its discharge; thus, there cannot be any evil suffered as now from the return of sewage matter by the rise of tide. All the foregoing evils being guarded against, the only possible danger to be apprehended is the stoppage of the "house refuse mains" from any cause; that is provided for as follows:—The filtering vacuum chamber is, as before stated, to be of dimensions sufficient to exceed the areal contents of the "house refuse mains" discharging into it. It is provided with a steam engine of sufficient power, which works an Archimedean screw, as is shown in the illustration at G, provided for the purpose of lifting the solid matter collected in the bottom of the chamber, and discharging it into a receptacle, H, above. This receptacle forms part of a machine situate on the floor of the shed or building erected upon the vacuum chamber, and its office is to intermix and at once convert the whole matter into a comparatively dry inodorous manure, capable of being removed by any kind of conveyance without inconvenience, or giving out smell in the slightest degree. This being intended to be the continuous process during the day, the solids will never accumulate, and whenever it be found that a stoppage has taken place, or if it be considered desirable, the following process can be effected at low water, in case of tidal rivers, or at any stated time in others, say, every twenty-four hours. The solids having been lifted out as described, the pump, I, will speedily remove whatever water may remain in the chamber to give an ample space for vacuum. This being done, the air pump, I′, will, by means of the engine, withdraw the air, the ingress and egress passages or valves being first securely closed, and when the vacuum has been attained, the ingress valve will be opened, when at the same instant of time the whole contents of the "mains," whether liquid, solid, or gaseous, must commence to move from end to end of the pipes towards the vacuum, and continue to do so until the space be entirely filled again. Thus stoppages in the "mains" will be in fact impossible, and inasmuch as that the matter discharged into the "mains" will not be subjected to the action of the atmosphere during its retention in them, noxiousness within the pipes will be totally prevented, and none of the gaseous emanations from night-soil, which now produce such damage to the health of towns and villages, will in future exist.

MODE OF COLLECTING THE EXCREMENT OF TOWNS.

Fig. 1

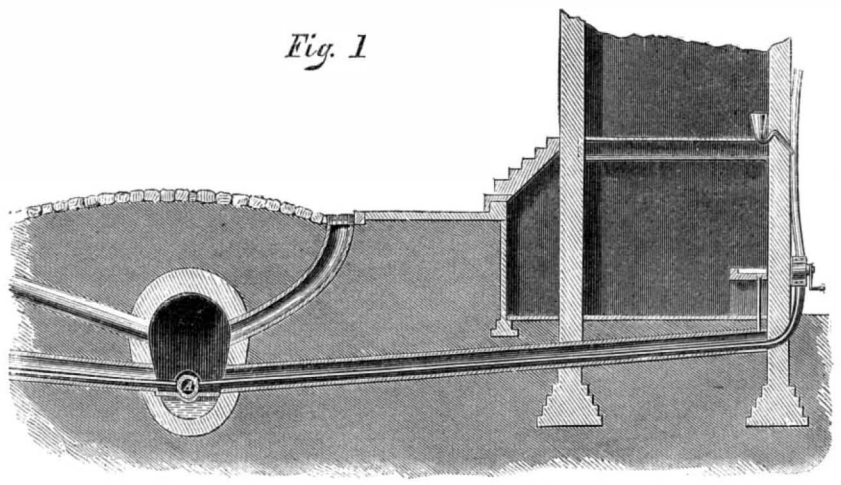


Fig. 2

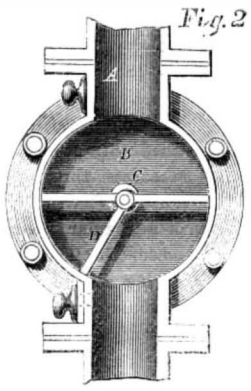


Fig. 3

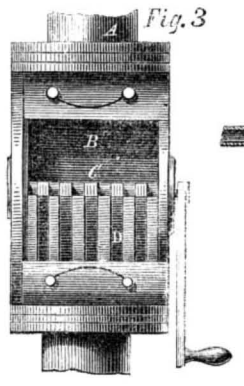
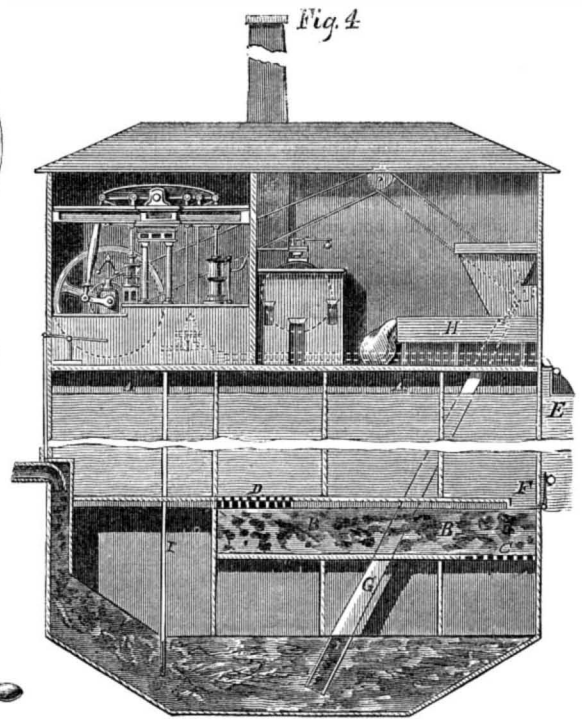


Fig. 4



In New England and the State of New York, there are districts in which much smaller crops are now raised on cultivated land than there were thirty years ago. "The land is run out," to use a common term. This has not been caused by any defect in the soil, but for want of a proper return of fertilizing material to restore "equilibrium," as Liebig would call it. These fields can be restored to fertility by supplying them with cheap manure. Millions of tuns of this flow down the sewers of our cities annually into the rivers and thence to the ocean. All this could be collected by the plan here illustrated. No land can ever *run out*, if properly cultivated and liberally supplied with manure, but to enable our farmers to raise large crops, and to raise them cheap, they must have cheap fertilizers. Guano and most artificial manures are too expensive. What city and company in our country will be the first to carry out this project, and thus convert a present nuisance into a future benefit?

A Georgia Locomotive.

The Savannah *Republican* states that a handsome new first class locomotive has lately been placed on the Georgia Central Railroad, every part of which, from the most minute bolt to the finished decorations, were completed at the machine shop of the company, under the superintendence of the chief machinist, William Burns. Very few locomotives are built by railway companies; they generally purchase their engines from independent locomotive builders.

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Scientific American.

NEW YORK, JANUARY 9, 1858.

The Old Year and the New.

In time, as in space, there are mile-stones which mark our progress in the journey of life: the New Year brings us to one of these. It is, therefore, another appropriate period to take a brief survey of "the way we have trod;" to take courage from the good which has been achieved; to forget the evils of the past, and to press on hopefully towards higher enterprises in the future.

During the year that has just departed, the SCIENTIFIC AMERICAN has paid fifty-two visits to its readers; each week it has come to them freighted with things new and useful relating to the progress of science and art in every department. It has statedly furnished them with information of the new triumphs of inventors in the fields of discovery; and it has exerted its influence for reform in law and policy, in regard to every question which has come within the legitimate scope of its labors.

The past year will be long remembered for the defeat and overthrow of the Woodworth Monopoly. This monster monopoly has met its just fate, and we feel constrained once more to congratulate the public upon having escaped from its burdensome impositions.

The Patent Office has undergone a change, in the resignation of its late worthy Commissioner, Judge Mason; but with many regrets for his departure, there is cause for rejoicing in the appointment of such an able successor as Judge Holt, who has already instituted laudable reforms for facilitating the business and securing the rights of inventors.

In agriculture much light has been thrown upon various subjects through our columns. The fact, formerly disputed, that cane sugar could be produced from the *Sorgho* plant, has been completely established, but further experiments are required to determine the economy of its culture for its saccharine qualities simply. A very large extent of our country suffered from the potato blight. Although much has been said and written, *pro* and *con*, regarding this evil, little seems to have been effected in preventing its annual recurrence since the time it first appeared. This is a question to which our agriculturists should devote especial attention this year. As the use of sulphur has been found to remedy the evil of the vine disease in France, its extended application to potatoes may produce a similar result here.

More activity has been displayed by inventors in improving agricultural machinery than during any prior period of the same duration. Our columns bear abundant evidence of the truth of this statement, containing, as they do, so many illustrations of the various kinds of machinery employed in this department of industry. There is still plenty of room for improving farming implements; perfection has not yet been attained in this or in any branch of mechanism.

The achievements of our inventors generally, during the past year, do them great credit, both as regards their number and importance. About two thousand seven hundred patents have been issued—being more than two hundred over the issues of 1856. Considering the disasters which have occurred in business, this is a flattering testimonial to their genius; but we trust they will reach a still more prominent position during the present year.

Our country has been visited with a most remarkable phenomenon in business. Without any serious losses by fires, flood, pestilence, or other irresistible natural calamities; with an abundant harvest and a steady stream of gold flowing into circulation, a panic suddenly seized our business community, and for a period there was a general suspension in payments and trade. The portentous wave which arose on our shores has swept over to Europe, and produced the same disastrous results there. Various theories have been advanced as to the primary cause of this singular circumstance; but without alluding to any of these, the truth has been made clear as the sun at noon-tide, that it is not gold which constitutes the real wealth of a nation, but its industry. When business was paralyzed, and the wheels of industry arrested, "hard times" came, in spite of all the gold in the nation's coffers. With the opening year, the prospect brightens for the resumption of steady operations in our factories and workshops. "Good times" will come again when all the people are busy at work, not before. Men of business should, therefore, exert themselves to set the wheels of industry once more in motion as speedily as possible.

The great *Leviathan* steamship has not yet been launched, according to the latest news received from Europe. Every foot over which it has been moved on the launching-ways has involved an expenditure of five thousand dollars; and the total cost of launching, if successful, will not be less than half a million. Money would have been saved had a special dry dock been made for her at first. A series of great blunders have been committed in this affair, which, had they occurred in America, there would have been no end to the jibes and jeers uttered against Brother Jonathan, for his ignorance and stupidity. But let that pass; we must, and do, make great allowance for the new difficulties which must arise in handling such a mighty mass of metal.

The year 1857 has been famous for the attempt (and failure) to lay down the ocean telegraph cable. The noblest vessels of the American and British fleets were placed at the disposal of the Telegraph Company, to effect the object; but failure was inscribed upon all their great and expensive labors for want of a good invention to graduate the varying strain upon the cable. Great preparations are now in progress, it is said, in London, for a second attempt to lay it during the next summer, and with new machinery to provide against former deficiencies. At this period last year, we stated to our readers that we hoped, with the opening of 1858, the ocean telegraph would be in operation. These hopes have not been gratified, and we look with a skeptic's eye upon the ultimate results of a second attempt.

Another great event which was to take place, and which did not, during the year that has gone, was the attack to be made upon our venerable Mother Earth by one of those stellar guerillas called *comets*. The collision, however, did not take place, hence we are still safe from the assaults of such an enemy, and are once more enabled to wish our patrons and friends "A Happy New Year." May none of them prove wandering stars during the year we have now entered upon, but genuine planets, throwing out beams of intelligence and genius, as they revolve in their courses, upon every dark corner of science, art, and philosophy.

The Mind and the Nerves.

The mind in the brain employs the nervous system as so many instruments of communication with the outer world. The eye is necessary to sight, but it does not see; for if the nerve which forms a communication between it and the brain be divided, the vision will be destroyed; and so with all the other organs of sense. Some have believed that the heart is the seat of the mind, and it is quite common to consider it the source of the affections. It is perfectly easy, however, to trace all the passions and mental phenomena to their great lodging-place in the brain. Vision has been destroyed in some persons, and yet by pressure on the optic nerve they have been haunted by illusions, believing that they saw objects which did not exist. After a person's leg or arm is amputated, he feels for a long time afterwards, as if his fingers or toes still belonged to him.

The spinal cord generates nervous energy for muscular actions, influences the secretions, regulates the motions of the heart, and maintains the action of the different organs in harmony to perform their several functions, but it has no relation whatever to the faculties of perception and thought. It is composed of the same material as the brain, but its fibers and vessicles are a constant repetition of the same structure, while in the brain there is an endless variety in their arrangements; this is the reason why the brain is considered to be a congerie of organs. A large extravasation of blood within the head, by the pressure which it causes on the brain, produces total insensibility to external impressions, and suspends volition. The effect of a similar injury to the spinal cord is very different. The parts below the injury are deprived of their sensibility, at the same time those parts of the body which are above the injury maintain their sensibility and power of motion unimpaired. A person who has received a mortal injury of the spinal cord in the neck may live for five or six days, nothing living but the head. A case of this kind occurred in the city of Brooklyn during the past summer. A young man, in the very prime of manhood, injured the spinal cord in his neck by striking the bottom of the river when diving; and while the body below the head is said to have been dead from the period of the accident, the head lived for several days afterwards, and the mind, during part of that period, evinced its consciousness.

The Good Time Come.

We are gratified to be able to announce to inventors, everywhere, that a "good time" has really come for them at the Patent Office.

The declaration of Commissioner Holt that the Patent laws, under his administration, shall be *liberally construed*, is being carried out in the most thorough and practical manner. Every department of the Patent Office begins to brighten up under the liberal system, large lists of patents are weekly granted, and general satisfaction at the decisions and management of the Office prevails.

Now is the time for inventors to apply for patents.

Now, especially, is the time for *rejected applicants* who are dissatisfied with previous decisions to petition for redress through rehearings.

The establishment of a regular Board of Appeals presents new and superior facilities for the examination, re-opening and re-decision of rejected cases. We would therefore call upon inventors in all parts of the country to *come forward* and file their appeals. Under Commissioner Holt full justice may be expected in every instance.

Those who desire professional assistance are informed that they can employ the services of MUNN & Co. upon terms quite as moderate as any other agency. Our experience and success in the prosecution of rejected cases have been very great. We have a branch office established directly opposite the Patent Office at Washington, which gives us important facilities in the examination of models, official papers, records, &c. One of the members of our firm devotes his time exclusively to the personal examination and prosecution of rejected applications. Except a small initiatory fee, we generally make no charge for our services unless we succeed in obtaining the patent.

Inventors who have rejected cases, *no matter of how long standing*, are invited to correspond with us. No charge for correspondence or advice. Send the official letters and such facts as are necessary to give us an understanding of the situation of the case. Address MUNN & Co., Scientific American Patent Agency, New York.

British Opinion of the Adriatic Steamship.

Capt. McKinnon, of the Royal Navy, who knows the qualities of both the British and American steamers well, and who was on board of the *Adriatic* during her late passage from Liverpool, predicted that she would make the voyage in 20 hours less than any other steamer afloat. She beat the *Persia* by about 24 hours. The captain says of her, "I feel satisfied that no person of experience can deny that the *Adriatic*, as a whole, is the *most perfect* sea-going steamer in the *world;* the clean, knife-like manner in which she cuts the water, is a perfect marvel. When on an even keel, there is no break of wave until the paddles strike the water. Astern, the sea is smoother than in any other place on the converging current, cutting off the heads of sea as a scythe cuts grass. I never remember being in a ship which gave me so much confidence as to strength, stability and power."

This tribute of praise to the *Adriatic* is as true as it is faithful. She is the most beautiful model of any vessel afloat. She carries Calcium or Drummond light signals, which can be seen at a great distance during night or even in fogs, which ensures safety from collisions. No expense has been spared to render her, in point of equipments, the first steamer in the world.

The Award of Prizes.

We have much pleasure in presenting the following names of the successful competitors for the prizes which we offered at the commencement of the present volume, amounting in the aggregate to Fifteen Hundred Dollars:

	Name.	Residence.	List.	Prize.
I.	D. McPHERSON,	Louisville, Ky.	252	$300
II.	L. L. BUTLER,	Buffalo, N. Y.	207	$250
III.	JOHN LANE,	Lockport, Ill.	200	$200
IV.	O. B. WATTLES,	Franklin, N. C.	170	$150
V.	H. S. BABBITT,	Newark, O.	153	$100
VI.	JOHN GARST,	Dayton, O.	120	$90
VII.	W. C. GRANT,	Detroit, Mich.	116	$80
VIII.	JOHN McVENN,	Galt, C. W.	103	$70
IX.	B. F. STROUD,	Johnstown, Pa.	103	$60
X.	WILLIAM TERRY,	Philadelphia, Pa.	84	$50
XI.	LORENZO CASE,	Watertown, N. Y.	76	$40
XII.	JAMES OLD,	AlleghanyCity,Pa.	71	$35
XIII.	J. F. LOVECRAFT,	Rochester, N. Y.	64	$30
XIV.	JOHN HERIGES,	Nashville, Tenn.	59	$25
XV.	W. E. COOPER,	Dunkirk, N. Y.	53	$20

We congratulate the parties above-named on their success. They have worked nobly; and, considering the serious financial embarrassments which have unhappily fallen upon the whole country, the number of subscribers furnished by each is very satisfactory, although doubtless much less than we should have received had the times continued prosperous.

The sums as they stand opposite to the names of each of the parties are subject to their respective orders, with the exception of Messrs. McVenn & Stroud, who having each sent 103 names, are each entitled to $65, that being the equal division of $130, the amount of the two prizes.

We thank our friends, one and all, for the interest which they continue to manifest in the success of the SCIENTIFIC AMERICAN; and to those who have not succeeded in the fair field of competition, we tender our special thanks. They have the satisfaction of knowing that, in extending our list of subscribers, they have given support to a cause of which they need not be ashamed. The promulgation of the arts and sciences is always an honorable employment, and to carry such knowledge into the workshops and homes of our industrious artisans is certainly worthy of all praise.

In reference to the payment of the above prizes, we would state that the parties can draw on us, either through an agency here, or by express; or if they prefer it, we will send our checks, payable to order, and duly certified (by the old, time-honored Manhattan Bank,) that they are "good" for the sums inscribed upon their faces. Such checks can be readily sold to merchants who may desire to transmit payments to New York City.

We make the above suggestions without intending to dictate in the least. We are ready and willing to pay the solid specie on demand.

Wm. Chauncey Langdon, late Examiner in the Patent Office, is about to enter upon the Christian ministry.

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Coke and Coal.

By distilling bituminous coal in retorts to obtain gas for illumination, or by burning it in kilns or pits, the residue left behind is called *coke*, which is simply coal charcoal, and is nearly pure carbon. In the distillation of coal, about one-third of its weight is driven off in the form of vapor and gas, yielding carbureted hydrogen, naptha, ammonia, and some other products. These originally formed the bitumen of the coal, which does not exist in anthracite; this latter being a natural coke produced, it is believed, from soft or bituminous coal, by subterranean distillation under great pressure.

Quite a spirited debate has lately taken place before the "Society of Arts," in London, on the comparative heating properties of coke and coal. This was elicited by the reading of a paper on the subject by Apsley Pellatt, a glass manufacturer, and it extended over several evenings. The author of the paper took the ground that as much calorific effect was produced by the combustion of coke made from a certain quantity of bituminous coal, as from the raw coal itself. Thus, for example if we suppose, that a ton of coal generates a certain amount of steam when burning under a boiler, two-thirds of a tun of coke will effect equal results. Mr. Pellatt stated, that this was an anomaly, but produced some authorities in support of his views, and gave as a scientific reason for the cause of this phenomenon, that, in order to convert a solid into a vapor or gas, even if it were by the combustion of that solid itself, a great quantity of heat was absorbed to cause expansion, and was carried off without producing any calorific effect upon surrounding objects.

At one of the meetings, Charles Wye Williams, who has written an able treatise on combustion, presented himself in opposition, and stated that there would certainly be an anomaly in the proportional calorific effects of coke and coal, if it were as stated by Mr. Pellatt, but the fact was otherwise. It indeed requires a great amount of heat to convert the bitumen of soft coal into gas, and this is all lost in badly constructed furnaces, but when there are arrangements made to burn the gas, the coal will produce, weight for weight, with coke, about as great calorific effects. The fact, however, was rendered very clear by the discussion, that about one-third of the heating effects of bituminous coal is lost in furnaces where there is imperfect combustion. In all those parts of our country where bituminous coal is the common fuel, those who use it should take cognizance of this. In practice it has been found, that, for a small concentrated fire, to melt metals or glass in crucibles, coke is a better fuel to use than bitumen coal, but is not superior to anthracite. A mixture of coke and coal makes the best fire under short boilers and in pottery kilns, but not under long boilers.

Important Patent Suit in England—Howe's Sewing Machine.

In the case of Thomas (assignee of E. Howe, Jr.) *versus* Foxwell, recently tried in the Court of Queen's Bench, before the Lord Chief Justice Campbell and a special jury, Howe's patent has been again sustained, and his claims have received a broader interpretation than in any previous suit.

In this case, which was supported on both sides by an array of legal talent seldom employed in one case, it was contended by the defense that Howe's invention was not new at the time of the granting of the patent, and that even if new, the defendant's machine was not an infringement. In support of the plea denying the novelty, no less than nine machines were set out, including every patent of the kind granted previously to the plaintiff's. In support of the other plea, denying infringement, it was contended that in the defendant's machine no shuttle was used to pass a thread through the loop formed by the needle thread, but another needle was employed which formed a second loop, and the stitch produced was different to that made by the needle and shuttle, and that as no portion of the plaintiff's machine was claimed by him as new in itself—the patent containing a disclaimer to that effect—but his claims were limited to combination, there could be no infringement.

Much testimony of experts was taken on both sides, and the floor of the Court was covered with models without which the testimony would have been unintelligible, the object of the plaintiff being to show in what respects the defendant had imitated his machine, and that of the defendant to show that he had done no more than the plaintiff himself, viz: had taken a great number of old machines, and taken parts of them, and made a machine which was no infringement of the plaintiff's patent.

The Lord Justice said there were two questions for the jury:—Whether the invention of the plaintiff was novel, and whether it had been infringed? As to the novelty, the plaintiff disclaimed the novelty of any particular portion; it was only a patent for a combination, and the point to be considered was whether that combination was new. The plaintiff claimed four things—the general arrangement of the machinery, the application of a needle in combination with a shuttle, the construction and use of a sliding frame (feed motion—EDS.), and the mode of actuating the frame and needle. If they believe, any one of these was not new, they ought to find for the defendant. As to the infringement, this being a patent for a combination, if the defendant used any substantial portion of the new combination for the same purpose as that to which it was applied by the patentee, the charge of infringement was supported, and it was not necessary that the whole combination should have been copied.

The jury found that the invention of the plaintiff was new on all four points, and that the defendant had infringed it.

This verdict does not state in what particular the infringement was considered to consist. Lord Campbell, in his charge, is more liberal in his construction of claims for combinations than our judges have been. The greatest latitude that has been allowed in this country for a combination claim, has been that it could not be evaded by the omission of any non-essential part, or by the substitution of equivalents for any of the parts embraced in the combination.

Purifying Rock and Sea Salt.

M. Margueritte, of Paris, well-known as a distinguished chemist, has discovered a valuable mode of purifying rock and sea salt. The latter is, for the most part, delivered for consumption in such a state that it is frequently desirable to refine it. When this is to be done, it is necessary to dissolve it again, and cause it to evaporate in a pan or boiler. The means which M. Margueritte proposes for purifying it consist simply in fusing the raw salt, and keeping it for some time in a state of tranquil fusion, decanting it into hot molds, or letting it cool slowly; in this manner all the impurities are separated from the mass in fusion, and are eliminated by crystallization by the dry process, which corresponds with crystallization by the wet process. Two layers are produced, of which the lower one is formed of foreign matters. When the cooling takes very long, the salt crystallizes in form and aspect quite analogous to that assumed by rock salt. Like the latter it is transparent, presents an equal purity, and possesses the same physical properties. When the cooling is rapid or sudden, the crystals are confused or indistinct, less transparent, and less voluminous. In either case, the mass previously crushed or pounded by submitting it to the action of a mill, is then separated in various sizes by means of sieves. This operation could be advantageously applied to purifying rock salt. This salt, which is perceptibly purer than sea salt, nevertheless contains earth and foreign matters, which give it a brown, green, and sometimes a red color, and render it unfit for immediate use. If the raw rock salt be fused on the hearth of a furnace, for example, and maintained in a state of tranquil fusion for some time, all the impurities settle to the bottom, and the coloring disappears by the oxydizing action of air under the influence of heat; and if care be taken to keep the current of air moist by a discharge of steam, the whole of the chlorid of magnesium is decomposed, and the mass can then be poured off to cool, or allowed to cool slowly. A mass of crystals, more or less transparent, according to the rapidity of the cooling, is so obtained, which are very white and pure.

Common Burning Fluid.

A correspondent writing to us from Seneca Falls, N. Y., states, that the best proportions of alcohol and camphene, for making the above fluid, are, one of fresh camphene to four of 95 per cent. alcohol, by measure. "If these materials are good," he says, "a perfect combination in these proportions will be effected, and the mixture will be quite transparent." We have always given the proportions of one of camphene to nine of alcohol, because it frequently happens, that the camphene contains a little resin in excess, and therefore requires more alcohol. The purer the alcohol, the more camphene will be taken up by it, and a better fluid produced. Three parts of pure alcohol (which is seldom to be obtained however) will take up one part of camphene, and make a very superior fluid to that in general use.

Magnetic Variations.

In a letter received from Samuel H. Jack, C. E., of Cecil county, Md., he states he has made careful observations to determine the true meridian for that place, and has found it to differ from what it should be by E. Loomis' map of magnetic variation in the United States. He made his observations as directed by Prof. Gillespie's work on surveying, and found the magnetic variation to be 3° 30. This is the same as that set down in the map referred to, in 1840; and as the variation at that place has amounted to 3° a year for thirty years, it should be 4° 21′ now. In making surveys, Mr. Jack should do so upon a meridian established by his own observations; but in making public reports of his labors, he should state this clearly, and the difference between it and the map in question.

Electric Guns.

A letter from Agra says:—"I don't think I have ever mentioned a notable and somewhat absurd feature of the rebellion—the electric guns; but they are so continually before me that I must disburden my mind of them. To preserve the electric telegraph posts, they were inserted in enormous iron screws, into the hollow of which the poles were inserted. It struck some ingenious native to make these into cannon. A hole was drilled near the apex, sometimes some iron bands were put round, to increase the strength; the piece was then mounted on a small gun carriage made for the purpose, and the result was a *topc*—that great instrument of terror to the minds of natives. The plan has met with vast favor, and these guns swarm all over the country."

Cure for Warts.

If they give you no special inconvenience, let them alone. But if it is of essential importance to get rid of them, purchase half an ounce of muriatic acid, put it in a broad-bottomed vial, so that it will not easily turn over; take a stick as large as the end of a knitting-needle, dip it into the acid, and touch the top of the wart with whatever of the acid adheres to the stick; then, with the end of the stick, rub the acid into the top of the wart, without allowing the acid to touch the healthy skin. Do this night and morning; a safe, painless, and effectual cure is the result.—*Hall's Journal of Health.*

On the Liverpool and Manchester road, of England, axles have been in regular use for twenty years, without failure.

Correspondents

R. B., of Pa.—Fuse thirty parts of gum copal in an iron vessel, and then pour in a like quantity of boiling linseed oil, rendered "drying" with sulphate of zinc, stir all well until the gum is dissolved, then cool down to 150° Fah., and add fifty parts of turpentine, now stir all thoroughly again, cover up the vessel close, and allow the contents to cool slowly. This makes a good varnish for handles of tools exposed to the weather.

W. B. R., of R. I.—We have always recommended the use of soft water when it can be obtained for steam boilers. If you turn back and read the articles published in former volumes of the SCI. AM, on water for steam boilers, you will find that we have uniformly advised the purifying of hard water before it enters the boiler. The prevention of incrustations by the use of chemical compounds, oak blocks, and sawdust, is the adoption of a lesser to remedy a greater evil.

S. S., of Ind.—The first electric telegraph laid down in England was inclosed in glass tubes, and buried alongside of the Great Western Railway track. Your method is to enclose the wire in a hollow part of the rail; the same plan has been presented several times to our notice. It is not so good as the method at present in use. The wire would be too near the metal of the rail; insulation, therefore, would be very imperfect, and besides it would be very difficult to make repairs.

J. J. O., of Ohio.—The Price Candle Company, of London, use a considerable amount of paraffine in the manufacture of their celebrated candles, and could probably give you all needful information as to its market value in England. We shall be glad to get those statistics whenever you are prepared to furnish them.

J. McM., of Ohio.—In the official list of Patent Claims, last week, is one for an apparatus for lighting gas by electricity. If you will send a sketch and description of yours, we can determine as to its novelty, as we are familiar with this subject.

F. R. B., of Pa.—There is a brief description of a gunpowder engine in "Stewart's Anecdotes of the Steam Engine," but gunpowder is inapplicable as a motive agent, owing to its sudden expansion into gas when ignited. The dirt formed by it after combustion is not the only insuperable objection to its use in cylinders, but also its action—operating in a succession of shocks, instead of by equal expansive pressure like steam.

D. B., of Mass.—If you had taken out a patent in due season for the curvilinear saw-mill, you would have been a rich man to-day. By procrastination you suffered another (who has now become wealthy) to invent, and subsequently take out a patent for the same thing. You should not neglect your other improvement until one has forestalled you in like manner. This is not the time for inventors to postpone for a single day making applications for patents on their inventions when completed.

A. P. M., of Ohio.—The quickest and best method of dissolving gutta percha is by immersing fine shavings, or cuttings of it, in naphtha, which must be kept in a warm place in a close vessel, and frequently stirred, until the gutta percha is dissolved. If you cannot obtain naphtha, use rectified spirits of turpentine, which is nearly as good.

D. A. B., of Ala.—The idea you suggest of transmitting the mail through an air-tight tube is not new. The use of a steam engine to blow the piston through, to which the bag is attached, is not different in principle from the atmospheric plan of Mr. Richardson, illustrated on page 265, Vol. 8, SCI. AM., and in theory or practice it is not so good as the device referred to.

A. S., of N. Y.—There is nothing so good as a model or machine to get up engravings from. A good photograph will answer if the machine is simple; but drawings of a complicated piece of mechanism should always be made from a model or machine. In your case, if the photograph is well taken. it may answer our purpose; but we much prefer a model or machine to take the views from, and may require the latter after seeing your photograph.

H. H., of Ill.—You had better open correspondence with the Childrens' Aid Society, in this city, in regard to the wants of your section. This society is doing a noble work in providing homes at the West, acting as a sort of exchange agency between the destitute here and those who feel it in their hearts to respond from the country.

C. S., of Mass.—Your theory respecting the cause of vibrations in some dams, we think, is correct. The inquiry to which you have reference extended to the use of pipes for very exposed situations; of course we could not recommend gutta percha pipes if there were the least cause to excite a doubt in their use. For many situations we belive they are superior to lead pipes; but if rats have, in some instances, gnawed into lead water pipes, they, no doubt, can cut through those of gutta percha with greater ease; at least, it appears so to us.

J. A. H., of Ill.—A patent could not be procured for arranging boxes upon an endless chain, for the purpose of carrying off and dumping dirt, &c. This device is now used for analogous purposes, such as elevating mud from the bottom of rivers, raising dirt from excavations, also for feeding brick to the press, and other similar uses.

S. C. M., of Ind.—If you wish to advertise your invention through our columns, you can do so by paying the usual rates, as published in another column.

D. B. R., of Pa.—The employment of water-tight sacks, made of india rubber or other elastic material, for the purpose of raising sunken vessels, is old and well-known. You cannot expect to get a patent on such sacks.

E. B., of Mass.—With a six foot fall and six inches opening, you will not have half a horse-power to drive a wheel. A hydraulic ram will suit your purpose better than a wheel. You will only be able to elevate about

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one-eighth the quantity of water fifty feet by a six-foot fall.

E. F., of Cal.—No government or society has ever offered a premium for the "quadrature of the circle." It is a popular error, which has been accepted by many persons, and is entirely without foundation. We cannot advise you how to bring your discovery (if discovery it be) before the mathematical world, and honestly tell you that we do not believe in the solution of such a problem.

Shepler & Clark, of Chambersburg, Pa.. wish to correspond with manufacturers of wood-working machinery, new and second-hand.

R. B. W., of Wis.—Your communication contains nothing of interest to our readers, as nearly every millwright adopts your method. We are, however, obliged to you, and shall be happy to hear from you again.

E. H. M., of Pa.—We have never been able to find Patent Reports back to 1844. Our opinion is that you cannot procure the Reports for a successive series of years. We occasionally meet with stray copies at second-hand bookstores.

W. B., of Tenn.—In Campbell Morfit's work, published by Parry & McMillan, Philadelphia, you will find the information you want in reference to various kinds of soaps. Lavender will grow in this country as well as in Europe. Address Professor Silliman, New Haven, Conn., regarding his Journal.

H. B., of Ind.—We cannot give the information you want. Address Lowell Machine Shop, Lowell, Mass.

A. H., of Wis.—It is evident that you are an inventor of the true metal. There is no use in being discouraged by the adverse state of the times. Now is the time to prepare for the future. The people of this country are not to be killed off in this manner; already there are signs of improvement in various quarters. All will soon come round again to a healthy condition.

R. C., of London.—We were obliged to modify your advertisement before its publication could be admitted. Such advertisements in this country are liable to involve publishers in trouble.

W. Fishbach, of Stanardsville, Pa., wishes to correspond with manufacturers of bent rims for truck wagons.

J. B., of N. Y.—Belt saws are old, and have not succeeded.

J. G., of N. Y.—It is not possible to get a patent for the use of hollow cane pipes for wells, cisterns, &c. No doubt cane is less liable to the destructive action of the elements, but to substitute its use for metal could not be considered as the subject of a patent.

A. W. S., of Conn.—Electro-magnetism has already been tried for car brakes, and is not patentable in this application; nor can it ever be rendered efficient, because it would require such immense batteries to be carried by the train to operate the magnets.

R. F. B., of Mo.—A gloss can be put upon white or colored cotton, linen or woolen goods by severe pressure. The gloss on linen pieces is produced by the calendering process, that on shirts by hand-ironing. The collars and bosoms of the shirts are thoroughly starched, then ironed on smooth boards covered with white pasteboard, to form a firm smooth surface. The irons must be pretty hot, pressed hard on the linen, and rubbed back and forth very rapidly.

F. W. M., of Vt., asks the following questions:—After a claim for a patent has been rejected by the Commissioner of Patents, is there any other appeal? Can Congress issue a patent? If so, will any further attempts be made to get ——'s case patented? Answer:—The Commissioner's decision, or the Appeal Board which assist him in the reviewing the decisions of the Examiners below, is the last step in the Patent Office, but the case may be taken to the District Court on appeal, by paying an additional fee of $25. This decision would be final. Congress will not interfere with the Patent Office department to grant patents, but may be petitioned to extend them after a petition for an extension has been refused by the Patent Office. The case referred to will be appealed to the District Court.

J. H. C., of N. Y.—Address any of the manufacturers of turbine wheels who advertise in our columns; tell them what you want, and the amount of your water power, and you will, no doubt, be able to obtain such a wheel as you desire. We do not know the price of burr blocks. You are quite right regarding the "fishing" of T-rails. Their joints, as you describe, should be so formed as to present a smooth face to the wheels. The track would be more durable if laid in this manner.

M. G. F., of Mass.—It would occupy too much space in our columns to give you rules for the construction of reflectors for lanterns. Get Dick's or Brewster's work on the construction of philosophical instruments; you will find full instructions in either of them.

C. E., of N. Y.—The general rule in shading drawings is to allow the light to come from the left corner. This, however, is not a rule universally followed by draughtsmen. A method of applying and operating a corn-planter by the foot, different from the one you describe, would be patentable. Principles are not patentable, only the means embraced in applying them.

L. A. H., of Ill., inquires, "When a patent is issued to two or more persons jointly, can either of them sell rights and make valid deeds for the same, without the knowledge or consent of the other parties holding an interest in said patent, or in selling a right, is it necessary that each individual to whom the patent is issued should sign the deed or contract?" Ans.—Under such circumstances both parties whose names appear in the patent must execute the assignment in order to make them legal.

H. J. B., of N. C.—There is no secret in the art of putting up oysters in self-sealing cans, nor is the process patentable.

Y. Z., of Pa.—A "perpetual motion" means a machine which has the power to set and maintain itself in motion. It should also have a compensating arrangement to prevent or supply the wearing out of its parts.

G. B., of Mass.—Sound is a peculiar sensation of the mind produced by the vibrations of the atmosphere acting upon the ear. The deaf are unacquainted with sound, therefore without the sense of hearing, sound would be unknown.

F. G. R., of Va.—The best way of rendering lard is by heat and straining in clear vessels, at as low a temperature as it is possible to use. Common sal-soda, which you have employed for this purpose is not suitable; it has a bitter taste, and forms the lard into an imperfect soap.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, January 2, 1858:—

E. C., of Mass., $25; H. H. L., of Ill., $25; A. B., of Ohio, $30; T. G., of Pa., $30; W. C. D., of N. Y., $100; H. & G., of Ohio, $30; S. W., of Mass., $130; E. W. S., of Ky., $305; S. B. & S., of Pa., $30; W. G., Jr., of N. Y., $37; I. C., of N. H., $40; C. & B., of Conn., $25; J. H. G., of Ky., $30; M. W., of L. I., $30; J. & S. P. P., of N. J., $25; G. P. K. Jr., of Ind., $25; E. B. B., of La., $29; W. H., of N. Y., $250; C. A. C., of Pa., $135; S. E. T., of Conn., $35; L. W., of Ohio, $30; L. S. C., of N. Y., $27; J. C., of N. Y., $27.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, January 2, 1858:—

E. C., of Mass.; H. H. L., of Ill.; J. C., of N. Y.; M. & G., of N. Y.; C. & B., of Conn.; J. & S. P. P., of N. J.; G. P. K., Jr., of Ind.; E. B. B., of La.; E. G. E., of R. I.; L. S. C., of N. Y.

TO OUR SUBSCRIBERS.

RECEIPTS—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of the receipt of their funds. The Post Office law does not allow publishers to enclose receipts in the paper.

BACK NUMBERS.—After the 1st of January, we shall commence sending the SCIENTIFIC AMERICAN to new subscribers from the time their names are received, unless the person ordering expresses a desire to receive the back numbers, in which case complete sets will be furnished from the commencement of the volume.

IMPORTANT TO INVENTORS.

THE RAPID GROWTH OF OUR PATENT Agency business during the past three years has required a great addition to our ordinary facilities for its performance, and we are now able to announce the completion of a system which cannot fail to arrest the attention of all who have business of this kind to transact.

OUR PRINCIPAL OFFICE

will be, as usual, at No. 128 Fulton street, New York. There is no other city in the Union so easy of access from every quarter as this, consequently there are greater advantages in regard to the transmission of models, funds, &c., through the various channels that center in New York. Two of the partners of our firm reside here, and during the hours of business are always at hand to counsel and advise with inventors. They are assisted by a corps of skillful Examiners, who have had many years of active experience in the preparation of cases for the Patent Office.

To renderour Patent Agency Department complete in every respect, we have established a

BRANCH OFFICE IN THE CITY OF WASHINGTON,

on the corner of F. and Seventh streets, opposite the United States Patent Office. This office is under the general care of one of the firm, assisted by experienced Examiners. The Branch Office is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

A SPECIAL NOTICE.

We especially require that all letters, models and remittances should be made to our address at New York.

EXAMINATION OF INVENTIONS.

We have been accustomed from the commencement of our business—twelve years since—to examine sketches and descriptions, and give advice in regard to the novelty of new inventions, *without charge*. We also furnish a printed circular of information to all who may wish it, giving instructions as to the proper method which should be adopted in making applications. This practice we shall still continue, and it is our purpose at all times to give such advice free and candidly to all who apply to us. *In no case will we advise an inventor to make application unless we have confidence in his success before the Patent Office.*

Our extensive experience in mechanical and chemical improvements enables us to decide adversely to nearly one half of the cases presented to us for our opinion, before any expense has occurred in the preparation of the case for a patent.

When doubt exists in regard to the novelty of an invention, we advise in such cases a

PRELIMINARY EXAMINATION

to be made at the Patent Office. We are prepared to conduct such examinations at the Patent Office through our "Branch Agency," upon being furnished with a sketch and description of the improvement. Our fee for this service will be $5.

After sufficient experience under this system, we confidently recommend it as a safe precautionary step in all cases before application is made for a patent—not that there will be no rejections under this system. It is impossible to avoid such results in many cases, owing to the exceedingly wide range taken by the Examiners in the examination of cases; but, nevertheless, many applicants will be saved the expense of an application by adopting this course. Applicants who expect answers by mail must enclose stamps to pay return postage.

THE COSTS ATTENDING AN APPLICATION

for a patent through our agency are very moderate, and great care is exercised in their preparation. No cases are lost for want of care on our part in drawing up the papers, and if the claims are rejected, we enter upon a speedy examination of the reasons assigned by the Commissioner of Patents for the refusal, and make a report to our clients as to the prospects of success by further prosecution.

A circular containing fuller information respecting the method of applying for patents can be had gratis at either of our offices.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of their case, enclosing the official letters, &c.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard Saint Martin, Paris; and 3 Rue Therrsienne, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information sent free on application.

☞ Remember the SCIENTIFIC AMERICAN PATENT AGENCY, No. 128 Fulton street, New York.
MUNN & COMPANY, Proprietors.

The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents:—

MESSRS. MUNN & Co.—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.
Yours, very truly, CHAS. MASON.

CAUTION TO THE IRON TRADE IN AMERICA—Richard Cort, the surviving son of the late Henry Cort, the great inventor of puddling, piling or balling, heating and rolling, for the manufacture of bar iron, begs to inform the Iron Trade of America that no other person besides himself has any authority whatever to collect funds for the Cort testimonial. Others are attempting to do it without any authority. Richard Cort's address is No. 26 Fleet st., London.

THE JANUARY NUMBER OF THE UNITED STATES JOURNAL contains twenty-two engravings, and is one of the most splendid mammoth pictorial sheets ever issued in this country. Price only 50 cents a year. Send for a specimen containing particulars of our rich premiums.
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SECOND-HAND MACHINISTS' TOOLS—Consisting of 20 Engine Lathes, 9 Iron Planers, 4 Upright Drills, Hand Lathes, Chuck Lathe, Gear Cutters and Vices, all in good order, and for sale low for cash. For particulars, address FRANKLIN SKINNER, 14 Whitney avenue, New Haven, Conn.

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MACHINERY.—S. C. HILLS, NO. 12 PLATT street, New York, dealer in Steam Engines, Boilers, Planers, Lathes, Chucks, Drills, Pumps; Mortising, Tenoning, and Sash Machines, Woodworth's and Daniel's Planers Dick's Punches, Presses and Shears; Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting, Oil, &c.

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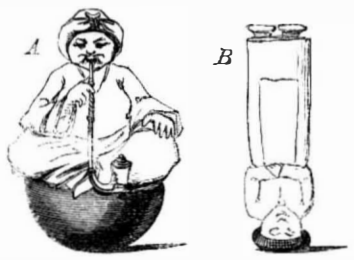
Our illustrations, this week, have reference to the center of gravity of bodies, or that point in any body about which all its weight may be said to be collected.

Among the novelties which scientific investigation has added to our toys are several figures which will raise themselves upright when thrown down, and regain the erect position, notwithstanding their equilibrium is disturbed. The figures themselves are made of the pith of elder trees, or any other very light substance. Each is placed on half a bullet, as at A, or may be made to stand on its head as at B, by making its cap of lead.



Their appearance is very droll when they are moved about, as they seem every moment to be falling over and yet continually right themselves. The philosophy of this is that the center of gravity being in the base and always trying to assume the lowest position, it keeps the figures upright. However much the equilibrium is disturbed, it will always try to regain its original position.

This engraving represents what seems to be an astounding statement, namely, that a quarter or other piece of money can be made to spin on the point of a needle. To perform this experiment, procure a bottle, cork it, and in the cork place a needle. Now take another cork and cut a slit in it so that the edge of the coin will fit into the slit; next

place two forks in the cork, as seen in the engraving, and placing the edge of the coin on the needle, it will spin round without falling off. The reason is this, that the weight of the forks, projecting as they do so much below the coin, brings the center of gravity of the arrangement much below the point of suspension or the point of the needle, and therefore the coin remains perfectly safe and upright.

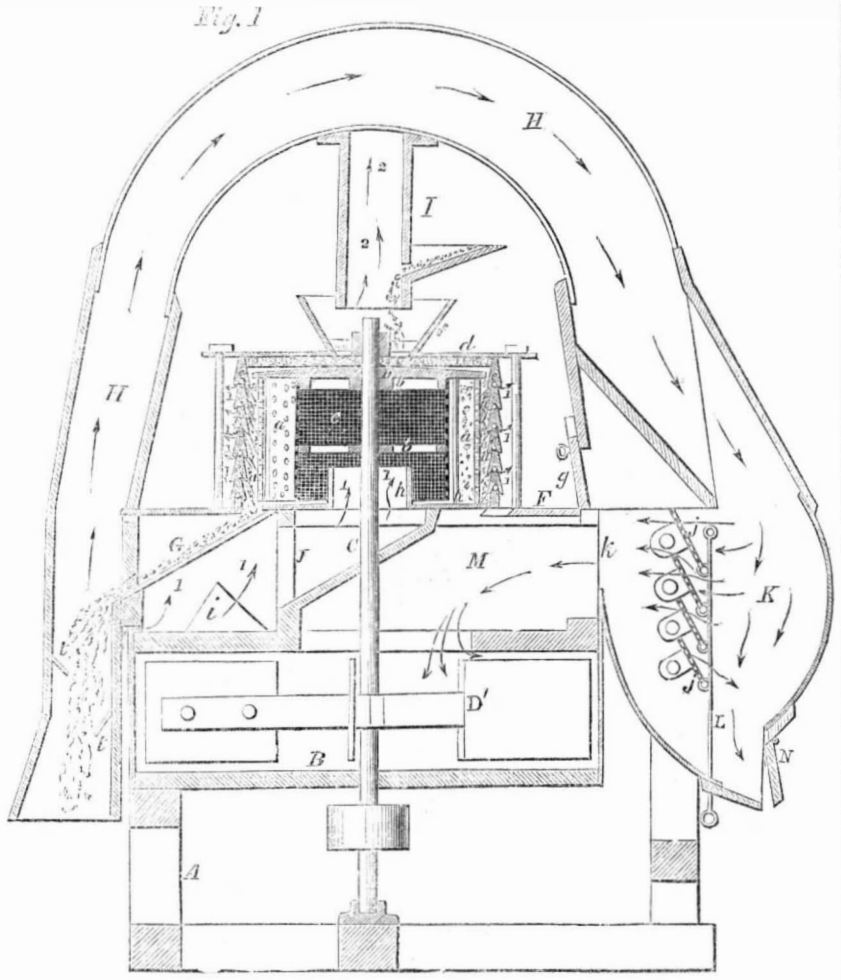
Improved Smut Machine.

This invention consists in the employment of a series of adjustable screens, so arranged in the principal blast spout, and placed relatively to the fan, that the escape of chess or light or imperfect grain may be regulated, and, when of any value, discharged from the machine separately and free from dust, or when it is worthless, it may be allowed to fall into the fan box and be blown away with the dust.

In our engravings, Fig. 1 represents a section of the machine, and Fig. 2 is an horizontal section of the beaters and cylinder in which they are placed, the same letters referring to similar parts in each. A is a frame in which a fan-box, B, is placed, and C is a vertical shaft, the lower end of which is stepped on the frame, A. The fan, D′, is placed on C, and a series of beaters, *a*, of a curved form, as seen in Fig. 2, are also attached to C, and secured to two wheels, *b b*, on the shaft, C, at suitable distances apart. A wire screen, *c*, is interposed between the beaters, *a*, and wheels, *b b*. These beaters are punched with holes having projecting edges on their outward sides, and they perform the office of screens. On the upper part of *b*, a horizontal scourer, D, is placed, formed of a circular plate corrugated radially; it is a little below the top-plate, *d*, of a cylinder, E, (Fig. 2) formed of a

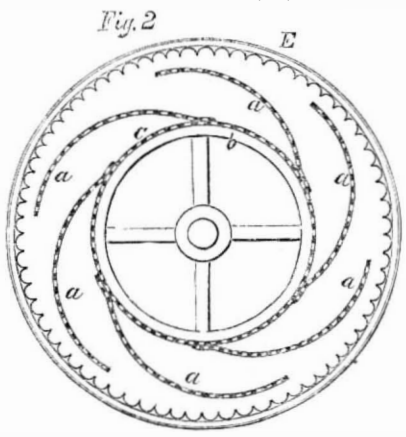
WOODWARD'S SMUT MACHINE.

Fig. 1



series of cast metal rings, *a′*, the inner surfaces of which are grooved vertically as seen in Fig. 2. The upper surface of each ring has small projections, *e*, formed on them to fit into a corresponding groove in the ring above it, their top surfaces being narrower than their lower ones. The cylinder, E, encloses the beaters, *a*, and rests on a platform, F, on the frame, A, the lower part of the frame having a spout, G, which leads into the blast-pipe, H. The spout, H, has a pendant spout, I, in its center, immediately over the hopper, *f*, in the center of the plate, *d*. The spout, H, has also a slide, *g*, on one side. The lower part of the cylindrical screen, *c*, communicates by means of an opening, *h*, made through the plate, *h′*, of the cylinder, E, with a passage, J, the lower part of which is open to the external air through the passages, *i*. One end of H terminates in a chamber, K, in which a

Fig. 2



series of screens, *j*, are placed, pivoted at their ends to the chamber, K, and connected by a rod, L, by operating which the screws may be moved like the slats of a blind. The back part of this chamber is in communication with a passage, M, by means of an opening, *k*, leading to the fan-box, B. The lower end of K is provided with a door or flap, N, and the opposite end of H has inclined ledges, *t*, in it.

The operation of the machine is as follows: The grain to be cleaned passes into the lower portion of the spout, I, and hopper, *f*, and down between the scouring plate, D, and top-plate, *e*, of the cylinder, E; the grain being scoured by D, and then passing between the inner and corrugated side of the cylinder, E, and beaters, *a*, it is further scoured until the smut is broken and dirt scoured away from the grains. The shaft C is rotated, and the beaters, *a*, perform the double function of beaters and fans; and while breaking up the smut also blow the dust through the spaces between the rings, *a′*, the arrows, 1, in Fig. 1 indicating the direction of the blast they generate, and all through the engraving, the arrows indicate the direction of the current of air. The grain is thrown from one side of the spout, H, to the other by the deflecting plates, *t*, to expose it as much as possible to the action of the blast. The sound grain passes out of the spout, H, while the light grain, chess, &c., is carried by the blast around it; the dust and fine offal passing through the screens, *j*. and passage, M, into the fan-box, B, from which it is ejected by the fan, D′, the light grain falls into the chamber, K, from which it may be collected through the trap, N.

It is the invention of J. A, Woodward, of Burlington, Iowa, and it was patented Oct. 20, 1857. Further information may be obtained from D. Keiser & Co., of the same place.

Amende.

The *Alta Californian* complains of the Scientific American for copying an article on "California Wines," some weeks since, and crediting it to the California *Farmer* instead of to the *Alta*, in whose columns it originally appeared. We plead "not guilty" to any intentional oversight in this matter. We received the article in *slips*, sent directly from a wine-grower in Los Angelos; and as they bore the imprint of the *Farmer*, we had no other just alternative but to so credit it. As we seldom get sight of the *Alta*, we shall certainly be excused for having once miscredited its productions.

White Printing.

A correspondent writing to us from Washington, D. C., gives it as his opinion that if books and papers were printed with white ink on black or dark colored paper, reading would not be so injurious to the eyes as it is at present. He says:—"The great flare which is reflected from the white pages distresses the delicate organ of vision, and interferes with the prompt transmission of the reflected letters to the retina."

Our attention was directed to the same subject, about two years ago, by a California correspondent, and published in a former volume. We are not inclined to adopt the opinion of our correspondent, especially as it regards paper with a black ground and white ink. If in reading, the eyes have to recognize a hundred letters per minute, the rays of light must be both absorbed and reflected a hundred times in that period. The eye is, therefore, subject to severe labor in reading, not on account of the white reflected light from the paper, but frequent intermittent absorption and reflection of light. This accounts for the effect called "dazzling," which is produced by looking for a very brief period on a piece of white and black checked cloth, the stripes of which are very fine, and of equal breadth—the black stripes absorb, and the white reflect the rays of light.

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